JPRS 75980

2 July 1980

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 50

FBIS FOREIGN BROADCAST INFORMATION SERVICE

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SUB-SAHARAN AFRICA

WEST EUROPE

IAEA CONSIDERS INTERNATIONAL PLUTONIUM STORAGE CONTROLS

Rotterdam NRC HANDELSBLAD in Dutch 24 May 80 p 12

[Interview with IAEA officials David Fischer, Director General Eklund's assistant, and Michael James, who coordinates and organizes the deliberations of the 25 advisors, by NRC HANDELSBLAD editor An Salomonson]

[Text] By 1983 at the latest there will be an arrangement for storage of plutonium under international supervision. That is the condition that the Second Chamber tied in 1978 to permission for export to Brazil of 2,000 tons of enriched uranium by Urenco's ultracentrifuge plant at Almelo.

Plutonium is left after the processing of enriched uranium that has been stoked into a reactor. This poisonous material can be used as raw material for a nuclear weapon. Since Brazil is not a member of the nonproliferation treaty and thus has never been under any official obligation to refrain from producing atomic weapons, there is no guarantee that the fissionable materials delivered by the Netherlands could not be used for military purposes. Storage of the plutonium under international control, to which Brazil has agreed, could provide that guarantee.

Should the IAEA [International Atomic Energy Agency] not have reached agreement on an arrangement of that nature by 1983, i.e. 2 years before Brazil can be expected to be in a position to process the uranium, the Netherlands and Brazil, according to the Second Chamber's decision, will have to reach agreement on a bilateral basis for a storage arrangement. In that case, Brazil has stipulated, the depot must be located in Brazil.

In January 1978 the Netherlands made the further condition that at the time of delivery, probably in 1981, there must

be an adequate prospect that such a plutonium storage arrangement will be established by the time Brazil can begin with the processing.

Are the preparations for such an arrangement really going smoothly now? Since December 1978, 25 countries have been involved in studying the possibilities for plutonium storage under international supervision--called IPS (International Plutonium Storage) for short--under the auspices of the IAEA. At the beginning of May the 25 experts, who do not officially represent their countries, but have the status of advisors to the director general of the IAEA, met together for the fourth time in Vienna.

There for the first time 13 articles of a proposed agreement which is to consist of 24 articles, as well as a proposed regulation for the procedure for issuing plutonium for the production of fissionable materials, were taken up for discussion. A similar but modified regulation on issuing plutonium for research purposes has yet to be proposed.

Unfortunately, the unclear position of America, which has not yet spelled out its definitive policy, was found to be a retarding factor early in May at the Vienna discussions. David Fischer, Director General Eklund's assistant, and Michael James, who organizes and coordinates the deliberations of the 25 advisors on behalf of the IAEA, explain how the international plutonium storage regime is going to function in practice.

All countries that are members of the IAEA have been invited to take part in the discussion of an international arrangement for storage of plutonium. As a result, the following countries are represented in the group of advisors:

Argentina, Australia, Belgium, Brazil (Chairman), Canada, Denmark, Egypt, Finland, France, Germany, India, Italy, Japan, Mexico, the Netherlands, Pakistan, Poland, the Soviet Union, Spain, Sweden, Switzerland, the United Kingdom, the United States, Yugoslavia, and the Commission of the European Community. All of the countries that may be involved in such storage because they now possess or will possess in the near future nuclear installations in which plutonium is produced, such as enrichment plants or quick-breeder reactors, are represented in the group. The political relevance of the negotiations is naturally considerably increased by this, although it has not yet been stated that all of these countries will actually sign the convention on international plutonium storage immediately.

A Viennese waltz translated into concrete. That is what the new "UN city" on the banks of the Danube looks like. High in one of the round wings resides the Englishman Michael James. Establishing a system for international plutonium storage seems to be becoming his life's work. He has been involved in it since 1976, when, partly at the instigation of Van der Stoel, then Dutch foreign minister, the idea of such a system began to take on more solid form. Together with David Fischer, a South African and director general Eklund's right-hand man, he explains how such depots, which will have to make the plutonium unavailable to terrorists and political adventurers, will look.

[Question] Where will the depots be located?

[Answer] There is no general consensus on that yet in the group of advisors. The general opinion, however, is that it should be possible to situate such depots wherever plutonium is present; i.e., at the end of the processing plant and at the beginning of the fissionable materials plant. We must not forget that if plutonium is produced anywhere, that is done only with the express purpose of using it again. If there were no demand for plutonium, it would not be produced at all in the civilian fissionable material cycle.

Now if we store that plutonium where it is extracted and where it has to be used again, normal nuclear industrial activity will be disturbed as little as possible. Furthermore, we shall not have to transport it over long distances in order to store it, which in itself naturally raises another serious proliferation risk. This way, the plutonium never leaves the factory premises.

Islands

[Question] Then the idea of establishing plutonium depots on lonely islands or in a few neutral countries has been abandoned?

[Answer] It has. Such an island would be useful only in a static situation--if one only wanted to get rid of it, if there were no more use for it. And as far as neutral countries are concerned: just find one neutral country that is ready to allow someone else's plutonium, one of the world's deadliest poisons, on its territory just to be stored there.

[Question] In the present situation, how many countries can be considered for such a depot?

[Answer] By the end of this century there will be only 12 or 13 countries at most: i.e., the countries that possess commercial processing and fissionable materials factories. And that is not so many; England, France, Germany with a test factory, Japan, which now has a test factory, but will

be producing enriched uranium on a commercial basis by the end of the century, Italy with a small test plant, the Soviet Union as we assume, India, Brazil with a very small one, Argentina perhaps, though the government there says something different every time, and Israel, where we assume a small processing plant exists. Thus there are now 10. Personally, I do not see that picture changing very much in the coming decades.

Governments

If we reach agreement in the next 3 or 4 years, let's say, on a system for international plutonium storage, then it will be up to the governments of the countries involved, where there are already large plutonium stockpiles, to decide whether they want to convert their national storage of plutonium into an international storage. For that they will have to conclude a number of agreements with the IAEA.

It is reasonable to assume that each of the 12 or 13 countries will have a definite interest in being chosen for an international storage site of that kind, to be situated in or near its nuclear plants. But we do not know now, of course, whether all of the dozen countries will actually be willing.

Extraterritorial

[Question] Will the ground on which the depot stands be declared an extraterritorial area?

[Answer] That makes no sense. Naturally, the host country will have to transfer a large measure of control over what takes place within the depot to the IAEA. Control over the issuance of the plutonium, whether it is for use in the host country or elsewhere, will have to be handed over entirely. The way it looks now, the host country will have to guarantee the absolute physical integrity and the physical security of the depot, and also safeguard any transportation of plutonium from it. And the industrial part of the plant will likewise still be controlled by the host country as it has been in the past. We are trying for minimal intervention in the daily course of events in the factory.

[Question] Who will get the key to the depot?

[Answer] We are thinking in terms of a two-key system. One for the IAEA controller, who will be present as a part of a five-man team. He will, quote, get a special status with a certain degree of immunity, end quote. This IAEA man has legal control over the storage and issuance. A second key is for control of the plant itself. Only together, with the combination of both keys, would they be able to open the depot.

Force Majeure

That way you are sure that no plutonium can be taken away without permission of the international authorities. Except in case of physical or military *force majeure*. That is a possibility you must always consider. It is inconceivable that any international organization would be able to resist a military takeover. Therefore, the physical security will have to be the responsibility of the host country.

The plutonium will be stored in a hall of, say, 10 times the dimensions of this counter, or roughly 50 m^2. We are talking here about plutonium oxide, not plutonium metal. It is slightly radioactive but extremely poisonous. It is packed in 2-kilogram biscuit tins. This hall will be under constant observation by means of TV cameras. It can only be entered by two controllers at the same time. Outsiders would have to pass through three different zones, each of the guarded, and no fewer than four controlled doors with detectors for fissionable material before they could get into the storage room or back out again.

Ownership

[Question] What about the ownership of the stored plutonium?

[Answer] It remains the property of the owner. He can do anything with it that he is doing now. He can sell it. He can lease it out. But neither he nor anyone else can get it out of the depot without meeting certain specified conditions.

These conditions come down to a requirement that after it is issued the plutonium can be used only for peaceful purposes. Those purposes must be described in full. The plutonium must remain under the normal control and bookkeeping system of the IAEA. It also must not be used to increase the national stocks of plutonium.

Informed

[Question] How must applications for plutonium be tendered, and who decides about them?

[Answer] The country concerned must fill out a form. That form asks for information about the amount of plutonium required, the date, and the purpose; e.g., production of MOX fissionable material (mixed plutonium and uranium oxide) in factory A for light-water reactor reactor B. All these data will be verified by staff members of the IAEA. They will be informed precisely about the activities of all reactors, because the latter will be under the control of the IAEA. Thus they will be able to determine specifically whether in fact such and such an amount of plutonium is needed. As far as MOX for light water reactors is concerned, there will be a large demand, but always from a limited number of countries. And as for fast-breeder reactors, the number of countries that need plutonium for them is not more than half a dozen.

There is an inclination among the group of advisors to put the decision on requests in the hands of a commission composed of representatives of the countries that take part in the IPS system. If it appears from the verification procedure that the applicant does not meet all requirements for issuance of plutonium, the commission will have to deny the application. It is obvious that the circumstances of such an application cannot be kept secret. The members of the commission and therefore the governments they represent as well will be curious to know how much plutonium country Z thinks it needs and for what purpose.

Bureaucratic

[Question] Will it be possible despite this procedure for an application to be handled so unbureaucratically fast that the applying country will not be hung up in its production process?

[Answer] That depends on what system the advisors finally choose and how much information is considered to be necessary about known nuclear activities. Naturally we are opposed to bureaucracy. But it will be a matter of months rather than weeks before an application is ruled on.

Therefore, the application should be submitted some time before it is necessary for the plutonium to be at the plant. Moreover, a special agreement should be reached between the country concerned and the IAEA for each fission plant about the maximum amount of plutonium the plant can hold in reserve. That way you avoid costly interruptions in production and you do not need to submit an application all over again for each kilo of plutonium.

[Question] How will the IPS get its international political status?

[Answer] The goal is probably a convention. Once the group of 25 has reached agreement on a draft convention, it will be submitted to the Board of Governors of the IAEA. That board is the international authority for all nuclear safety guarantees, and that is where a system of internationally controlled plutonium storage belongs, too.

25 Years Ago

The countries concerned will petition the board for implementation of Article XII A 5 of the IAEA charter. In that article the possibility of such storage was described at the founding of the IAEA 25 years ago. If the Board of Governors approves the draft convention, it will be submitted to all countries for signature, both members and non-members of IAEA, that are ready to accept the obligations and responsibilities that arise from the convention.

[Question] Will they succeed in getting the draft in shape before 1983? And will the NAV [expansion unknown] assay conference this coming summer be a disturbing factor?

[Answer] If nothing intervenes, at the current tempo of two to three meetings a year, each lasting a week, it should be possible to have the definitive draft convention ready within a year. The advisors' tempo is less decisive, however, than the general climate in nuclear world politics. I do not believe that the assay conference will spoil things for the discussions. The atmosphere among the advisors, including the one from the European Commission, is outspokenly cooperative and constructive. Of course, taking part in the deliberations does not mean a commitment to sign the convention right away.

Agreement

[Question] When the IPS is worked out, will requirements for export of nuclear technology and materials be set such as "full-scope safeguards" (control on all nuclear activities in the participating country) and/or a demand that permission of the supplier be sought prior to processing of the material supplied?

[Answer] There will be no direct connection. There cannot be. The convention is intended as a system of rules for everyone--producer and consumer, industrialized state and developing country. They will all have the same rights and responsibilities. We hope that a sound IPS will have the very effect of making other export conditions superfluous. There is no longer any reason to maintain the requirement of asking the supplier's specific permission when you have established an international plutonium storage, but on the other hand neither is there any obligation to scrap that requirement.

IAEA Exempts Nuclear Weapons Countries

The present control system of the IAEA, to which all the countries that are parties to the nonproliferation treaty except the nuclear weapons countries have submitted, consists of a sort of bookkeeping of the fissionable material that is circulating in the installations of the country in question. Thanks to the bookkeeping, the inspectors of the IAEA can determine whether any fissionable material has disappeared anywhere. This is still always necessarily a determination after the fact, and this is regarded as a great objection to this type of security guarantee. The bookkeeping on light-water reactors is rechecked four times a year by IAEA inspectors. For that kind of installations this is regarded as sufficient. In the case of the new generation of processing plants, it is hoped that a continuous inspection by the IAEA can be instituted, in which the inspectors will verify every "input" and "output" (what is put in and what is taken out). The big problem in the present situation, however, is that the two biggest processing plants, namely the one at The Hague, France, and the one at Windscale, England, are neither one under the control of the IAEA.

England, to be sure, is a party to the nonproliferation treaty, but as a nuclear weapons state is not required to let the IAEA check its nuclear activities. But London has concluded an agreement on a voluntary basis with the IAEA to put all of its civilian nuclear activities under security guarantees.

Because of difficulties with Euratom, this agreement, although valid, has not yet come into effect. When this barrier is overcome--as may be hoped for within a few months--the control will be able to begin. Then even the big new processing plant in Windscale will be subject to it, insofar as it is working for nonmilitary purposes. That at least will signify progress.

France, on the other hand, has never been willing to sign the nonproliferation treaty, even though it is a member of the IAEA. It has, however, declared itself willing to permit IAEA inspection of its nuclear activities, though without specifying at the same time that this will apply to all peaceful activities. There is thus no question of complete control in this case. Other countries, such as Germany and Japan, which have long allowed everything to be inspected, consider this an unacceptable discrimination. England and France, to be sure, are both in possession of nuclear weapons, so that inspecting their nuclear installations would be beating a dead horse, so to speak. But materials are also processed there for other countries and developing countries. They also feel it to be an economic disadvantage. They feel that international supervision must not become a one-way street in the sense that nonnuclear powers must take the wraps off all their newest technical gadgets for foreign inspectors, while countries like England and France do not have to do that. Even though IAEA inspectors are recruited with care, it is unavoidable that in the long run such technical advances attain a certain familiarity in technical circles. The countries concerned find that to be a commercial disadvantage.

All this will be a thing of the past once there is just one international storage system and countries like England and France enter into it. And that certainly looks likely at the moment.

8815
CSO: 5100

FRANCE-INDONESIA NUCLEAR AGREEMENT SIGNED

Paris LE MONDE in French 4 Apr 80 p 17

[Article: "Nuclear Agreement Between France and Indonesia"]

[Text] An agreement on the peaceful applications of nuclear energy was signed on 2 April in Paris between the Atomic Energy Commission (CEA) and its Indonesian counterpart, Batan. It is one of the folds of the more general agreement on science and technological development which Pierre Aigrain, Secretary of State for Research, signed in May 1979 in Djakarta.

The new agreement prolongs and enlarges the cooperation which for ten years has already been established between the two organisms. It is supposed to cover the following areas: nuclear physics, reactor physics, utilization of radioisotopes, nuclear safety, radioprotection and radiation chemistry. It foresees also the exchange of experts, the formation of trainees, and the provision of specialized equipment capable of contributing to the development of nuclear energy applications in Indonesia. In this regard, Technicatome, a branch of CEA, is supposed to respond to the international call for biddings launched by Batan for the provision of a 30-megawatt research reactor.

On the other hand, CEA and the National Institute of Nuclear Research of Mexico have just established the bases of an agreement of cooperation between the two countries.

1751
CSO: 5100

VISITORS NOTE FRENCH INTEREST IN AUSTRALIA'S URANIUM

Brisbane THE COURIER-MAIL in English 10 May 80 p 13

[Text] Paris (AAP).--France was aware of the energy and natural resources Australia had to offer, an Australian Minister said yesterday.

He is the Special Trade Representative's Minister, Senator Scott, who led an information mission to France.

On the four-day mission, Senator Scott had talks with the French Economy Minister, Mr Monory, the Industry Minister, Mr Giraud, and with businessmen and bankers.

The mission visited the Atomic Energy Commissariat and the uranium enrichment plant at Tricastin.

Senator Scott said the two economies were complementary. France was a sophisticated technological giant and Australia, a land of considerable expertise and massive natural resources.

He said these resources were particularly coal and uranium.

Senator Scott said his French contacts understood that Australia, which intended to increase investment in exploiting coal and uranium, sought guarantees on quantities purchased.

These quantities concerned the size of markets and how long they would be available.

Senator Scott said France was interested in diversifying sources of supply, by taking part in developments.

He said he hoped an agreement on uranium would be reached.

A third series of meetings on safeguards would be held in Canberra in July, he said.

Senator Scott said the problem of participation by France and other countries in a uranium enrichment plant in Australia was still being studied.

A French delegation headed by Mr Giraud will visit Australia, probably in September.

CSO: 5100

ADELAIDE CONFERENCE DISCUSSES, DEBATES NUCLEAR POWER

Nuclear Waste Disposal

[Perth THE WEST AUSTRALIAN in English 13 May 80 p 11

[From the feature page on the Australian and New Zealand Association for Advancement of Science congress held in Adelaide]

[Text] Two CSIRO scientists told the conference that there would be pressure for Australia's arid zones to be used for burying nuclear waste and obsolete weapons.

They said that the storage of discarded radioactive waste would become a reciprocal part of arrangements for the sale and export of uranium.

The two scientists are Dr R. D. Graetz and Professor D. J. Tongway, of the CSIRO's division of land resources management in Deniliquin, NSW.

They said that because much of Australia's uninhabited arid lands were also stable they were attractive sites for the deep burial of nuclear waste from reactors or for obsolete weapons.

The feasibility of this had increased with the development of safer immobilising chemical storage methods.

GENERATIONS

A leading Australian environmental psychologist told the congress that the next 12,000 human generations would be in danger from waste products from nuclear power stations.

Professor G. McBride, of the psychology department at the University of Queensland, said nuclear waste would remain dangerous to all living beings for more than 300,000 years.

The quantities already in storage were impressive. But the cost of monitoring them and applying controls for 300,000 years was breathtaking.

Professor McBride said few people had faith that controls could be maintained without mistakes.

"Of course, the responsibility is not ours," he said. "It is handed on to 12,000 human generations.

"They did not seek this responsibility, yet the total cost we impose on them, through a probable series of ice ages, will be infinitely greater than any benefit we can conceivably gain from the power."

Scientist Supports Nuclear Power

Brisbane THE COURIER-MAIL in English 14 May 80 p 15

[Text] **ADELAIDE. — Governments could not gamble on energy possibilities such as solar, wind or wave power, eminent Australian scientist Professor Sir Ernest Titterton said yesterday.**

He told the ANZAAS Congress the world had to bank on certainties and had no alternative but to move towards reliance on nuclear power.

Nations must undertake massive investment in nuclear energy, he said.

It was the only available large, proved source of energy for society if energy shortages which could return us to living standards of the early 1800s or worse, were to be avoided.

No solar, wind or wave power station had yet been built that could match the output of major coal, oil or nuclear power stations, let alone been shown to be technically and economically viable.

Opponents of nuclear power pursued propaganda lines that nuclear power was expensive, unsafe, environmentally undesirable and likely to lead to future difficulties, Sir Ernest said.

But the safety record of the nuclear industry was far better than that of any comparable industry.

In more than 3000 power reactor years of operation, not a single person had been injured, let alone killed.

He said there had been an effort recently to create a myth that something terrible had happened on Three Mile Island in the United States.

Clash on Nuclear Safety

Sydney THE SYDNEY MORNING HERALD in English 14 May 80 p 1

[Text]

ADELAIDE. — A distinguished Australian physicist and a Canadian professor have clashed at the ANZAAS congress over the safety of nuclear energy.

Professor Fred Knelman of Concordia University, Montreal described Sir Ernest Titterton as one of a "lost breed" of physicists whose "strange love" for nuclear energy almost amounted to "religious fervour."

Their disagreement became apparent on Monday, the first day of the congress of the Australian and New Zealand Association for Advancement of Science.

It arose during discussion of Professor Knelman's address on the politics of risk assessment, at a symposium on risks.

Professor Knelman, who is Co-ordinator of Science and Human Affairs at Concordia, used radiation and chemical hazards to illustrate his contention that assessment of risk was biased towards continued growth.

Sir Ernest, from the Department of Nuclear Physics at the Australian National University, questioned this claim.

Yesterday, in a paper delivered to the engineering section, Sir Ernest described nuclear power as "the cheapest, safest and most environmentally desirable means of power generation yet devised by man."

The industry's safety record was astonishingly good: not a single person had been injured, let alone killed, as a result of the nuclear side of the power industry.

Professor Knelman later held a press conference at which he strongly attacked Sir Ernest, calling him "a nuclear theologian."

His claim about safety was irresponsible because it failed to take into account the proven cancer risk to uranium miners who were part of the nuclear industry.

Professor Knelman, who described himself as a "notorious, but not implacable, opponent of nuclear power," said even pro-nuclear people now accepted that the three major problems — reactor safety, high-level waste disposal and nuclear proliferation — remained unresolved.

CSO: 5100

BRIEFS

PAKISTANIS IN AUSTRALIA--Australia may have inadvertently helped Pakistan develop a nuclear bomb. The Deputy Prime Minister, Mr Anthony, said yesterday two Pakistani scientists received nuclear-technology training at Lucas Heights research station near Sydney in 1976. Mr Asif Salahuddin and Mr Arif Ahmad Syed were being trained at the Australian School of Nuclear Technology at a time when Pakistan had openly declared its intention of developing nuclear capability. [Text] [Canberra THE AUSTRALIAN in English 1 May 80 p 1]

CSO: 5100

QUEENSLAND PREMIER DISPUTES ENRICHMENT PLANT RUMORS

Perth THE WEST AUSTRALIAN in English 15 May 80 p 27

[Text] Townsville: Queensland Premier Joh Bjelke Petersen yesterday appealed for an end to what he termed ignorant, over-emotional claims about a possible uranium enrichment plant in North Queensland.

Recent renewed opposition to plans by a French-based company to mine uranium deposits in an area known as Ben-Lomond, outside Townsville, were childish he said.

"There is nothing sinister, in fact nothing unusual about the French company's recent success in gaining a mining lease over the Ben-Lomond deposits," he said.

"But there have been some ridiculous suggestions since the company, Minatome, was granted the mining lease.

It was being said, and obviously for political purposes, that the granting of the mining lease was the first step towards the establishment of a uranium enrichment plant in Townsville.

"This is not on. I hope that some day soon work will start on such a plant in North Queensland, but it will be in some isolated area and certainly not next door to the residential areas of Townsville," the Premier said.

He said the actual mining of uranium by the company would start in the Ben-Lomond area and was scheduled to start no earlier than 1984.

Queensland should be welcoming this new mining venture because of the extra jobs and extra prosperity it would bring.

"People must be careful to weigh up the ignorant, over-emotional arguments against the nuclear energy industry," he said.

"Everyone should take a lead from Mary Kathleen uranium miners who decided only last week to defy union directives that they should quit the mine and turn their backs on their own future."

CSO: 5100

CANCER DEATH LINK WITH AUSTRALIAN ATOMIC TESTS STUDIED

'AGE', 'ADVERTISER' Reports

Melbourne THE AGE in English 7 May 80 p 16

[Report by Mark Metherell]

[Text]

The sky caught fire. The welders' goggles we wore changed the landscape to a bleak coppery green of the horizon, where the thing stood on its tower 15 miles away.

"The fireball turned it momentarily to gold and flung a brief wave of brilliance over the entire sky."

Those lines were despatched to 'The Age' on 15 October 1953 by eminent British foreign correspondent James Cameron from "somewhere in the abandoned hinterland to the far north-west of Adelaide".

They describe the explosion of the atomic bomb X200, the first to be detonated over mainland Australia, at a site later revealed to be Emu Field, about 250 kilometres north-west of Coober Pedy.

At the time, British and Australian defence authorities insisted there was no danger from fall-out to test personnel or to Aborigines in the area. Nuclear scientists who attended the blast still insist this to be the case.

But a recent series of reports in 'The Advertiser', Adelaide, have disclosed 52 deaths from cancer among the 2000 people who worked at the testing sites, and illness and death among Aborigines soon after the tests.

There was one test at Emu in 1953 and seven at Maralinga between September 1956 and October 1957.

According to one modern theory, research in the past 10 years has turned up evidence that low levels of radiation are more dangerous than was thought at the time of the tests in South Australia.

In those days it was considered that small radiation fell below critical levels, fall-out would not cause cancer.

Dr. Joseph Rotblat, professor of physics at Australian National University, said an observer at the tests emphatically disputes suggestions that more recently-acquired knowledge casts doubts on the accuracy of safety precautions at Emu and Maralinga.

"As far as this is concerned, nobody has brought forward any evidence that has any validity," Sir Ernest told 'The Age'. Under normal conditions the incidence of deaths from cancer was about one in five, he said.

Using these figures, and taking into account that many of the people who attended the tests would now be in their sixties, it would not be surprising to find 400 of them struck down by cancer.

"Radiation precautions were taken (in South Australia) and they were absolutely first class . . . there was no significant radiation dosage to any individual," Sir Ernest said.

The radiation protection officer at Melbourne University, Mr Rob Rowbottom, a former scientist at Harwell nuclear research centre, England, holds a very different view.

"The important point to remember was that in those days it was thought there was a threshold of radiation below which nothing would happen," Mr Rowbottom said.

"It has become apparent in the last 10 years that no such threshold exists. There is increasingly greater evidence that exposure to low levels of radiation are more dangerous than what was thought and certainly more likely to produce cancer."

Mr Rowbottom said that exposure to radiation might not show any side-effects for 10 to 15 years. "It is not unexpected that isolated cases (of cancer) were not tracked down at first.

"This fits in with what happened in the United States at a Nevada testing site. There was a change in winds after they detonated the device and it blew across the city of St George."

A subsequent inquiry had produced evidence of links between the test and the incidence, much later, of cancer.

The 'Advertiser' has reported accounts of rudimentary protective measures, of failure in some cases to adhere even to what pre-

cautions were the rule during the tests in South Australia.

There were accounts by those present of countless incidents of known contamination of workers there, not to mention the unrecorded effects on however many Aborigines who wandered unheeding through "hot" areas.

At the weekend, the newspaper reported that sickness, blindness and death struck a group of 48 tribal Aborigines who were enveloped in a "rolling black mist" after the Emu test.

'The Age' contacted Mr Ian Beadell of the Defence Research Centre at Salisbury outside Adelaide. He was raponsible for surveying the Emu and Maralinga sites and has written several books on the tests. He said he always wondered what had happened to a group of about 12 British scientists who were the first to enter the imediate test area and measure radiation levels.

"They were from the Atomic Weapons Research Establishment at Aldermaston in England and nobody has ever mentioned how they fared," said Mr Beadell.

"They were known as the RH (radiation health) team and they went into the bomb areas well before anyone else. They were loaded up with instruments, including gamma monitors and dosemeters to test radiation levels."

Mr Beadell said that as far as he could remember they wore exactly the same protective clothing as that worn by others who went in later. "I think some of our fellows started to get sick and they went into the area sometime after the Aldermaston men."

In his article for 'The Age' in 1953 Mr Cameron wrote: "It is true that within minutes of the explosion the first exploratory parties in protected clothes were examining the zero point around the ghastly blackened scar."

'The Age' telephoned Mr Cameron in London to check if he remembered any other details about the RH team. He said that while he remembered the blast, he could not remember writing the article.

A spokesman for the Ministry of Defence in London Mr Martin Helm, said the Ministry had no evidence that the health of civilians or scientists had been affected by the tests.

Mr Helm said that over the years the Ministry had received about six compensation claims from people claiming to have been affected by the tests. But none of these claims had been successful, Mr Helm said.

Study of Aborigines

Melbourn: THE AGE in English 12 May 80 p 3

[Text]

ADELAIDE. — At least 30 and possibly 50 tribal Aborigines are reported to have died after contact with a "black mist" believed to have been fall out from British A-bomb tests in South Australia in 1953.

The dead are among an estimated 1000 people thought to have been directly affected by the weapons test — the first nuclear detonation on the Australian mainland.

These figures are revealed by a preliminary health survey of four north-west SA tribal communities by Dr T. M. Cutter of an Alice Springs based Aboriginal health service.

Many Aboriginal communities are thought to have been affected by two "black clouds" after powerful A-blasts at Emu Field in October, 1953.

Dr Cutter said he and members of the Central Australian Aboriginal Congress had received consistent information about the black mist from people living in four remote communities — Ernabella, Kenmore Park, Mimili, and Indulkana.

He said the expected occurence of cancer in the areas was about one case in five years but, in recent times, it had risen to about two cases a year. He intends to return to the far north later this month for more detailed tests, such as blood sampling and possible X-ray screening.

The congress has sent an anthropologist, Mr Dan Vachon, into the area to gather further information.

Dr Cutter returned to Alice Springs yesterday and will report today to a combined meeting of the Pitjantjara Council and Health Service and the congress. The meeting is expected to call for a full independent inquiry into the effects of the weapons tests on Aborigines. The Pitjantpatjara Council will meet its legal advisers tomorrow to assess new developments.

"We will be pursuing remedies," Mr Phillip Toyne, the council's legal counsel, said yesterday. "This seems to be much more widespread than we realized at first."

Dr Cutter said the information gathered so far was preliminary and warned that the death figures could rise when other communities in SA and the Northern Territory were surveyed.

Effects on RAAF Crew

Brisbane THE COURIER-MAIL in English 12 May 80 p 7

[Text] Some Royal Australian Air Force ground crew had fingernails removed after working on aircraft used in 1950s nuclear tests, it was claimed yesterday.

The fingernails were pulled out to remove deposits of radioactive dirt.

Some RAAF engine fitters found that their hair fell out.

A Brisbane woman last night told of her husband's experience as an RAAF engine fitter at Amberley, Maralinga and Monte Bello, in Australian and Kobe, near Hiroshima, in Japan.

The woman, who requested anonymity, said her 55-year-old husband was due to have cancer surgery on his throat in a few days.

"His work was secret. He never talked about it to me," she said.

After recently learning that persistent nausea and sickness, which he had suffered since the 1950s, were symptoms of radiation sickness, he contacted the Australian Nuclear Veterans Association.

The man retired from the RAAF after 25 years' service and has not worked for the last six years.

"When they worked on these bombers, they wore white overalls, with covers over their boots, but their hands were exposed," she said.

"My husband was worried about one occasion when the wind blew dust over him. They used to joke: Don't touch me, I'm radioactive. Nobody knew the real dangers then."

The Brisbane-based provisional president of the ANVA, Mr Pat Creevey, said last night there was evidence that Lincoln bombers exposed to radiation were handled at the Amberley RAAF base before proper radiation safeguards were enforced.

Some parts were removed from the aircraft and stored in hangars.

Mr Creevey has received reports that some radioactive aeroplane parts were dumped into the sea off Brisbane.

"People were working on these Lincolns. One day some RAAF superiors came up from the south and tested them. There was an emergency and they were forbidden to have anything more to do with the aircraft," he said.

"After this, the Lincolns were taken to another part of the base and a deactivation centre was built around them and from then on, precautions were taken.

"We are anxious to get hold of these people and put their names on our national register."

Mr Creevey said the association wanted ex-servicemen and their doctors to complete confidential questionnaires prepared by the association's medical officer.

The association was also compiling a file of statutory declarations from people who worked on 1950's nuclear tests and in Japan, for its case to the Federal Government for an open judicial inquiry.

CSO: 5100

BRIEFS

MARY KATHLEEN WORKERS--Mount Isa.--Electrical Trades Union workers at Mary Kathleen will defy a union directive to withdraw from all Australian uranium sites. ETU representative Mr Bob Starr said the decision was unanimous. Mount Isa and District Trades and Labor Council said it would help ETU members hold their jobs at Mary Kathleen. [Text] [Brisbane THE COURIER-MAIL in English 9 May 80 p 3]

JOINT VENTURE PLANNED--As a prelude to a joint exploration venture yet to be finalised, two Sydney-based companies, Stellar Mining NL and Kratos Uranium NL, have issued share options to men associated with their exploration activities. Both companies are controlled by Mr A. Pongrass. The companies announced yesterday that they had "decided to combine their exploration efforts" but said details had not yet been finalised. [Excerpt] [Sydney THE SYDNEY MORNING HERALD in English 8 May 80 p 23]

MARY KATHLEEN SALE PROBLEMS--The Government has run into severe problems with its plans to sell the Australian Atomic Energy Commission's stake in Mary Kathleen Uranium. The market value of the share has been cut virtually in half in the three months since detailed work on the divestment plan began. The proposal is "still under examination" according to a spokesman for the Minister of Trade and Resources, Mr. Anthony. The spokesman acknowledged that selling the 41.6 per cent AAEC stake was "not such a simple operation" as disposing of the Government's share of the Ranger joint venture. The Government's problems relate to the fact that the AAEC holding is in shares. Not only does legislation have to be satisfied, but stock exchange listing requirements have to be met. [Excerpt] [Melbourne THE AGE in English 7 May 80 p 27]

TALKS ON ENRICHMENT PLANT--Canberra: The National Development and Energy Minister, Senator Carrick, will ask a government group to have further talks with the South Australian Government about a proposal for a uranium enrichment plant in the State. He told the Senate yesterday that the Federal Government had invited a group of business men to study the question of such a plant. [Text] [Perth THE WEST AUSTRALIAN in English 2 May 80 p 9]

ROXBY EXPLORATION ACCELERATES--Western Mining Corporation Ltd and BP Australia are making an almost immediate start on sinking a 500-metre-deep exploration shaft at their Roxby Downs copper-uranium discovery in South Australia. The decision marks a significant speeding-up in the already accelerated program to assess the vast mineral deposit thought to contain at least five million tonnes of copper and 280,000 tonnes of uranium oxide. Results from nine holes reported yesterday gave copper grades ranging up to 3.04 per cent (over a 74 metre intersection) and uranium oxide grades up to one kilogram to the tonne (over 47 metres). [Excerpts] [Sydney THE SYDNEY MORNING HERALD in English 2 May 80 p 19]

CSO: 5100

TARAPUR POWER STATION REOPENS, LEAKS DESCRIBED

Bombay THE TIMES OF INDIA in English 15 Apr 80 p 1

[Text] Bombay, April 14 (PTI): The Tarapur atomic power station's unit one, which had been stalled by leakages in its water cooling system, went into production early today, it was announced here.

The unit had been shut down from December, 1979, for refuelling and routine maintenance.

With both the units of the power station now in full operation, Tarapur resumes supply of power to grids on Maharashtra and Gujarat.

The discovery of the leakages, which made headlines last month, retarded the production schedule by about six weeks without, however, posing any radiation hazards, according to the Tarapur atomic power station authorities.

No Radioactivity

According to experts in Tarapur, the leaks which were noticed could not have caused any disaster even if the reactor was in operation. There are provisions for monitoring leaks and for bringing the reactor to a safe shutdown condition. The design is such that even when a 24-inch pipeline ruptures with the reactor operating at full power, the reactor can be brought to safe shutdown condition without any escape of radioactivity from the reactor containment.

Forty-two reactors of this type in operation in other parts of the world, notably in the USA, Europe and Japan, have also experienced leaks from similar pipes five to six years ago and corrective measures have been taken in these installations also. In the case of Tarapur, because of "better operating practices" and superior material of construction, leaks appeared in these pipes after ten years of operating the unit.

The consequence of the recent repairs to the cooling system was loss of power production and it did not have any impact on the safety of plant personnel and the environment.

CSO: 5100

BRIEFS

HEAVY WATER PRODUCTION--Naya Nangal, Punjab, April 21 (PTI): India is on the threshold of meeting its heavy water requirements indigenously for its nuclear energy programmes. This rare and expensive commodity is also meant for export. This indication was given by Mr B.S. Kakkar, the general manager of the Nangal fertiliser factory, here yesterday to visiting newsmen. Mr Kakkar said of the three plants in the country, the Nangal unit alone was producing heavy water at present. The plants at Baroda and Tuticorin stopped production some time back due to "mishap." They are expected to be on stream shortly. Two new plants are also being set up, one at Talcher in Orissa and the other at Kota in Rajasthan. Once these were completed, the country would start exporting heavy water, Mr Kakkar said. The country will save valuable foreign exchange, since the production cost would be Rs ten lakhs per tonne as against Rs 25 lakhs per tonne of imported heavy water. Mr Kakkar said, during 1979-80, the Nangal plant produced 11.5 tonnes of heavy water despite power constraint. This level was achieved as the Nangal plant had the exclusive facility of upgrading tritiated water received from the Bhabha Atomic Research Centre in Bombay. [Text] [Bombay THE TIMES OF INDIA in English 22 Apr 80 p 15]

CSO: 5500

RADIOACTIVE MINERALS FOUND ON TIMOR ISLAND

Jakarta KOMPAS in Indonesian 21 Apr 80 pp 1, 12

[Article: "NTT Has Many Mineral Resources That Could Be Developed"]

[Excerpts] Many minerals such as barite, copper, lead, sulphur, lead sand, and gypsum have been discovered in East Nusat nggara, according to Cesarius Castillio, who last week told of a "Bukit Setan" [Satan's hill] in East Nusatenggara which very probably holds a large amount of good quality uranium.

Castillio discovered Bukit Setan unexpectedly in 1971 when he was surveying the area for limestone in connection with establishing a cement plant in Kupang (Timor).

At that time, Castillio said, we stayed overnight in the Oesuu kampung in East Kupang Subdistrict, about 36 kilometers from the city of Kupang.

The persons who knew Castillio was a geologist told him of a "haunted hill" that people had been avoiding for decades.

Castillio decided to take a look at Bukit Setan. He was interested in learning what was there and following his strong hunch that there might be some connection with people's avoidance of the hill and strong radioactivity. Castillio's belief was firmly bolstered by his view that a number of the world's important discoveries revealed various secrets of nature and were often based on superstitions such as those held by the people of Oesuu kampung.

Castillio's hunch about there being radioactive minerals in Bukit Setan was also proved out. The Geiger counter which he moved over the ground made a loud noise as the needle swung sharply up the scale. A number of malachite chips at the bottom of a dry river reacted strongly to the Geiger counter. The needle of the Geiger counter registered 250 on the apparatus' scale. Thomas, who was frightened by this, was ordered to remain with Tony on the other side [of the river bed]. Although he was given extra compensation to stay, he no longer wanted to stay with Castillio.

Furthermore, Castillio himself was frightened by the terrifying scene before him. "It was the most hairraising and haunted scene I have ever encountered, although I have been exploring the islands of the Teduh Sea and most of Indonesia since the 1940s," Castillio said.

The hill called Bukit Setan is conical in shape, terraced, and laddered with brownish red, greenish violet, yellowish white lines. Other lines coil around the hill at oblique angles in layers 10 centimers thick. Some are vertical. Round stones as big as corn or peas are scattered over the top and sides of the hill. Some are serrated and oval in shape. Green, red, brown, and black veins like those of copper are clearly visible on the hill. Of course, these are copper veins, but these veins are different from any Castillio had ever seen.

Around the hill, he discovered hillocks which appeared to be held up by some power from within the earth. On top of these hillocks were collections of some black mineral formed into plates which clung together. These plates were scattered over an area about 1 kilometer long and 0.5 kilometer wide, which included a number of bare hills and plains. The Geiger counter used on them indicated that the entire region was radioactive, registering 275 on the Geiger scale.

Further investigation showed Bukit Setan consisted of sediments from the erosion of the surrounding hills which apparently disintegrated very quickly. The soil consisted of a red clay, containing about 6,000 to 10,000 parts per million PPM of Pb [lead] and about 40 PPM of Zn [zinc]. Above the copper vein, copper (Cu) content was 6 percent and azurite and malachite comprised 60 percent of the Cu. The area around Bukit Setan consisted of a red layer (laterite) about 10 centimeters thick that was rich in Cu, with many scattered patches of azurite and malachite. Also a fine black mineral was found in clusters on the other side of the hill, extending from north to south. At a depth of 10 centimeters, there were rocks composed of compacted sandstone sediment and porous tufa containing silica. They were gray in color, showing some weathering and fractures. This was the first time Castillio had found minerals with these colors. The colors of the azurite and malachite were unusual. Also finding Pb (barium) [as published] in the azurite and malachite was far different from what he had discovered in other places in Timor.

When he used a magnifying glass on a number of the malachite fragments, Castillio saw barium crystals. This mineral is very difficult to ascertain because its crystals are very delicate. It cannot be tested for hardness.

Ordinarily copper is found with Pb (lead) and Ba (barium), Castillio said, but only in comparatively small amounts. This situation was out of the ordinary since Pb and Ba cannot be seen with the naked eye or found in areas where there is radioactivity so Castillio strongly felt that radioactive uranium and thorium were definitely to be found in the earth.

Three types of lead, each with different atomic weights, later proved that there were three types of uranium in the area: the elements U 234, U 235, and U 238.

Castillio, who only began to make surveys seriously after he acquired the Geiger counter in 1972, said he had made this survey alone. Other than because the equipment was expensive, Castillio realized that anything involving uranium had to be kept secret until the accuracy of his investigation could be ascertained.

Cesarius Castillio began his work by conducting a number of geological surveys in Flores in 1935. His father was of Philippine extraction. He died in 1946 in Larantuka, leaving his son the legacy of "wanting to know something." It was Castillio's nature to examine everything carefully for "cause and effect." As a result he also had a wanderlust. He was born in Labuan Bajo, West Flores, 64 years ago when his parents were roaming about seeking and diving for pearls.

Castillio's schooling went as far as the 5th grade in the Schakelschool (people's school established during the Dutch regime) in Ndao Ende, Flores. His hobby was reading any book on which he could lay his hands, and this made him more of a wanderer from 1935. He explored the regions from Kalimantan to East Irian, Manado to Timor, and even areas in nothern Australia, the Great Barrier Reef to the east, and some of the islands in the Teduh Sea. His only background for this exploration was the knowledge of geography he acquired in his five years of schooling in the Dutch elementary school.

In wandering through these various regions, Castillio had opportunities to participate in various survey missions led by British and Australian geologists, investigating the sea floor, the bowels of the earth, pearl diving, and geological surveys, in general.

The practical experience he gained was augmented by his hobby of reading and made him more persevering in matters involving geology, particularly after he was married in Larantuka, East Flores.

6804
CSO: 5100

FEASIBILITY STUDY ON NUCLEAR PLANT COMPLETED

Jakarta MERDEKA in Indonesian 28 Apr 80 p 5

[Article by Soegyarto Ps: "PLTN Now at the Threshold"]

[Excerpts] The feasibility study for the construction of the first Indonesian nuclear power generating station (PLTN) has been completed precisely within 2 years' time as planned. The results have been submitted to Prof Subroto, minister of mines and energy, to provide information for rational consideration by the Indonesian Government in deciding to build the first PLTN in Java.

The feasibility study was begun in early 1978, following the signing of a cooperation agreement between the National Atomic Energy Agency (BATAN) of Indonesia and NIRA (National Atomic Energy Agency) of Italy in Jakarta on 16 December 1977, within the framework of implementing cooperation in science and technology between the Indonesian Government and the Italian Government.

According to the BATAN director general, we must be concerned with at least three factors which deal with the use of nuclear energy in attempting to meet electric power requirements, particularly in Java which has the most dense population in Indonesia:

1. The world energy situation is increasingly strengthening man's awareness of the limits to energy resources, particularly oil.

2. The Indonesian energy and economic situation has required us to seek immediately an alternative energy source for oil, especially for electric power generating stations in Java.

3. Electric power supply requirements to support national development efforts will rise rapidly in the coming decades, and nuclear power is one of the alternative energy sources that must receive primary attention in order to meet these requirements.

To review the history of pioneering PLTN, the concept of using nuclear energy as an alternative energy source for electric power generating stations

in Indonesia apparently was launched in 1968 at the Nuclear Power Introductory Seminar held in Cipayung. This seminar was followed by a second seminar held in Yogyakarta in 1970 at which, among other things, it was proposed that the BATAN-PUTL [public works and electric power] Cooperation Committee (now the Public Works Department) be formed.

The seminar proposal was carried out and the PLTN Development Preparatory Commission (KP2PLTN) was born in 1972. Since that time the commission has produced studies of activities, collected data, conducted development surveys, and made plans within the context of formulating a proposal and a policy preparatory to the construction of the first PLTN in Indonesia.

The path toward realization of the concept launched in Cipayung apparently has widened increasingly, particularly after the 1973 energy crisis that created awareness in societal groups of the limits to energy resources. In this connection, the Indonesian Government requested the International Atomic Energy Agency (IAEA) to conduct a parallel preliminary study on the development of PLTN in Indonesia. The study was accomplished in 1975 jointly by BATAN, the State Electric Power Company, and IAEA.

The results of the study were published by IAEA in 1976 under the title, "Nuclear Power Planning Study for Indonesia (Java Island)," and, among other things, it indicated that there were rather great prospects for the role of nuclear energy in Java. On this basis, attempts were made to obtain technical assistance to implement the feasibility study on building the first PLTN in Indonesia.

In addition, in 1975, BATAN and the State Electric Power Company moved toward selecting a site for the PLTN and, assisted by an IAEA consultant in 1975 and 1976, verified the selection methods and provisional selection of the site. Attempts to obtain technical assistance for the feasibility study from the Italian Government were successful only in 1977, and at the end of that year the BATAN-NIRA cooperation agreement was signed.

The feasibility study basically consists of an indepth and detailed analysis of all the strategic, technical-economic, environmental safety, and funding aspects involved in constructing the first PLTN in Java.

Four task forces were formed, each of which was to study one of these aspects: long term strategy for development of energy resources in Indonesia; industrial, economic, and technological aspects of developing the first PLTN; problems involved in the safety, environment, and suitability of the proposed PLTN site; and funding.

The feasibility study for constructing the first PLTN in Indonesia, among other things, concluded that because of efforts to optimize the use of oil resources which have played a very important role as a producer of foreign exchange as well as a source of state income and a source of energy, along

with the rate of economic growth and intensified use of energy whereby Indonesia will become a net importer of oil by the 1990s, it is proposed that the state, which has a population of about 140 million persons, employ two strategies:

1. Make conscientious efforts for energy conservation, limiting the use of oil in the agricultural, services, construction, and industrial sectors and substituting oil with non-oil fuels. This can be realized by emphasizing only those activities that have a low energy use.

2. Expanding the use of electricity that can be generated with non-oil fuels, using an attractive form of energy.

According to the feasibility study, the electric power load in Java is estimated to peak at 21,000 MW in the year 2000, which means installed capacity will peak at 28,500 MW. With the limited energy resources available to produce electricity, oil for electric power generation can only be replaced with coal or nuclear power, within the 20 to 30-year time frame.

Basing the evaluation on data for the cost of generating electric power with the latter two types of energy, among other things, coal costs $40 per ton and uranium $42 per pound. Thus the cost of generating electricity with nuclear power is 28 mills per Kwh and with coal is 32 mills per Kwh. Both costs are calculated for a generating unit producing about 600 MW (for the PLTN, the Candu type producing 638 MW and for the coal powered PLTU producing 660 MW). This proves that a PLTN can compete economically with coal-powered PLTU.

6804
CSO: 5100

PLANS FOR NUCLEAR TECHNOLOGY DEVELOPMENT TOLD

New Delhi PATRIOT in English 15 Apr 80 p 5

[Text]

PAKISTAN will intensify its efforts to acquire 'a fair degree of self-reliance' in the nuclear technology by 1983 reports UNI.

This involves prospecting for uranium and other nuclear minerals, the acquisition of modern technology, and development or adaptation of techniques for chemical processing of indigenous uranium.

Other projects which will receive attention are production of heavy-water and acquisition of basic nuclear technology for self-reliance in nuclear power generation, according to a paper submitted by Pakistan delegate Dr M D Shami at the seminar on determination of priorities in science and technology.

Dr Shami is a member of the University Grants Commission, Islamabad.

The paper says, research activities at Pinstech and the nuclear institute in agriculture and medicine will continue to be strengthened.

According to the paper, so far, a turn-key approach has been adopted in the nuclear energy field because of high sophistication of nuclear technology. Increasing attention is now being paid to developing local capability in the area. These efforts would be intensified to acquire a fair degree of self-reliance by 1983, the paper explains.

The paper entitled 'priorities in science and technology' details the steps being taken by the Pakistan Government in framing a strategy for the development of S and T during the fifth plan 1978-83.

The first priority in the proposed strategy will be to enhance the level of self-reliance in science and technology and concentrated efforts will be made to encourage and improve the development of indigenous capability.

The Pakistan Government, according to the paper, proposes to strengthen the existing centres of technology and research to improve their performance and commercialise their research results as far as possible.

It is envisaged that more appropriate institutions will be created to conduct research and development and help import technology on a selective basis. The ultimate aim is to create a high level scientific and technological manpower, needed for the management of technology and indigenous research, as well as for the application of technology to achieve more rapid development.

During the plan period, steps will be taken to ensure better public understanding and greater public participation in the application of science and technology.

PRIORITIES

Meanwhile high-level discussions on the determination of priorities in science and technology in the developing countries began here on Monday.

About 80 delegates comprising scientists and policy makers from Afghanistan, Australia, Bangladesh, Burma, Iran, Indonesia, Nepal Pakistan, Sri Lanka and India are participating in the 10-day seminar.

Prof M G K Menon Secretary, department of science and technology, stressed the need for increased allocation of funds for the development of science and technology and according priorities for their growth.

There was an urgent need for working out ways and means to meet basic needs of the rural population through science and technology, he added. There had been a great deal of expectation on this.

The growth of modern science in India during the post-independence period, Mr Menon said, was made possible by the late Jawaharlal Nehru. In India planning in S and T gathered momentum from 1958 with the Constitution of National Committee on Science and Technology (NCST).

Mr Menon also called for utilisation of resources in an effective and systematic manner by allocating priorities.

CSO: 5100

NUCLEBRAS PRESIDENT DISCUSSES EXPORTS TO ARGENTINA, OTHERS

Rio de Janeiro JORNAL DO BRASIL in Portuguese 21 May 80 p 23

[Text] NUCLEBRAS [Brazilian Nuclear Corporations] president Paulo Nogueira Batista said yesterday that the nuclear agreement signed on Saturday with Argentina--providing, among other things, for the supply of Brazilian nuclear equipment for the Atucha II Argentine nuclear power plant--"makes us believe that, looking to the future, we will make similar shipments to third countries since this gives us credibility as manufacturers of nuclear equipment."

NUCLEP (NUCLEBRAS Heavy Equipment, Inc) will furnish the vessel for the Atucha II reactor in its capacity as subcontractor of the German KWU [Power Plant Union] enterprise which has the orders for the main equipment items for the Argentine plant. But according to Mr Nogueira Batista there is no obligation that this pattern will be continued in future exports. "The situation could even be turned around, with the KWU acting as subcontractor for NUCLEP," he said.

Technology

The NUCLEBRAS president said that the supply of equipment for Argentina will be possible only because the Atucha II reactor is based on KWU technology. Although it may be a reactor working with heavy water and natural uranium--whereas NUCLEP is equipped to build light-water and enriched-uranium reactors--the two types of reactors are quite similar since both of them come from KWU. NUCLEP will begin the production of the reactor vessel for Atucha II during the coming year and will take between 30 and 36 months to complete the job. The price of the equipment will depend on contract negotiations which will be started in the meantime.

Mr Nogueira Batista expressed the belief that another condition, without which NUCLEP could not furnish equipment for Argentina, is the technical support given by KWU, the coowner of NUCLEP. "Without technical backup support from KWU," he said, "we would be unable to handle this supply contract because we have no tradition as manufacturers of nuclear equipment."

After guaranteeing that Brazil will be able to export nuclear equipment, in the future, independently of KWU, because it has a nuclear engineering company--NUCLEN [NUCLEBRAS Engineering, Inc]--which permits it to be the leader in an operation of this kind, Mr Nogueira Batista noted that, "in a certain fashion, the model of the nuclear accord between Brazil and Germany is being followed by Argentina" since that country is putting together an engineering company along the lines of NUCLEN with the same participation which KWU has in the Brazilian enterprise.

The NUCLEBRAS president revealed that the enterprise is already thinking of installing reactors with up to 2,000 Megawatts power (Angra-2 has 1,300 Megawatts). "NUCLEP was dimensioned for this, and, if the engineering studies now underway prove that it is worthwhile, the following eight plants provided for in the agreement between Brazil and Germany will have 2,000 Megawatts." He recalled that the vessel for the Atucha II reactor, which NUCLEP will make, has the same dimensions as the reactor vessel of a plant of the Angra 2 type, with 2,000 Megawatts power, although Angra II will be a plant with only 700 Megawatts.

Another point in the agreement between Brazil and Argentina is the leasing, in 1981 and 1982, of 240 tons of Argentine uranium concentrate (yellow cake) by NUCLEBRAS. The company president said that this leasing transaction will be necessary because the Brazilian uranium concentrate plant, at Pocos de Caldas has been reprogrammed and will become operational in 1981 at a production rate that will be insufficient to take care of the demand during that year and the following year. According to Mr Nogueira Batista, the renting of uranium concentrate can be a reciprocal matter, if Argentina should be interested in Brazilian yellow cake. The Pocos de Caldas mill is designed to produce 550 tons per year and, after 3 years, its capacity can be doubled. Since Argentina is starting the project for a new plant--the one at Serra Pintada--it could rent the Brazilian product if there were some problems in the timetable.

As part of the agreement between Brazil and Argentina, provision has been made for the supply, by Argentina, of uranium concentrate production technology through the pile lixiviation process. This is a process which does not require the crushing and milling of the mineral, in contrast to the process used at Pocos de Caldas, and it is indicated for low-content mineral spread over a very large area, as in the case of the mineral at Amorinopolis, in Goias.

Mr Nogueira Batista stressed the fact that the agreement signed with Argentina does not "imply any change whatsoever in the type of nuclear program adopted by the two countries or any renunciation of the intention of each country to pursue objectives aimed at the greatest possible sufficiency in each sector of nuclear industry." He added that "this involves provisional complementary steps whose in-depth development and durability will

always depend on the judgement of each of the parties as to the greater or lesser convenience of having full autonomy at any given moment."

At the end of his interview, the NUCLEBRAS president announced that he would, on the next day, 11 May, testify before the Parliamentary Investigating Committee of the Federal Senate which is investigating the Brazilian nuclear program and the accord between Brazil and Germany.

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CSO: 5100

NUCLEBRAS FINANCIAL CHIEF RESIGNS OVER POLICY DIFFERENCES

Sao Paulo FOLHA DE SAO PAULO in Portuguese 3 May 80 p 4

[Text] Rio--The financial director of the Brazilian Nuclear Corporation (NUCLEBRAS), Vicente da Costa Silva, resigned from the company because of "complete disagreement" with its president, Paulo Nogueira Batista, area sources revealed yesterday. The differences over the financial policy of NUCLEBRAS--Vicente da Costa Silva assumed the position on 22 March 1979--led the former financial director to request his resignation for the first time on 6 March of this year but Minister of Mines and Energy Cesar Cals refused to accept it. The second request, made on 24 April, was accepted by the minister 3 days ago.

Lack of Administrative Discipline

According to the same sources, one of the reasons for Vicente da Costa Silva's resignation was "the arbitrary decision of the president of NUCLEBRAS, altering the company's organization in early March and changing the responsibilities of the directorate, the financial section of which was separated from the accounting and costs section: The former was directly under the president of the company "leaving the directorate only the duty of signing checks."

The source added that there is "a complete lack of internal coordination within NUCLEBRAS: The table of organization has been 'verticalizei' and the directorates have no autonomy; in addition to being president of the holding company, Paulo Nogueira Batista holds the position of director-president of the five NUCLEBRAS subsidiaries, being exlusively responsible for the hiring and firing of staff members, the movement of personnel and accounts to be paid, in addition to convening the executive board, which has not met for "40 days." According to the sources, "There is a complete lack of coordination within the system of the nuclear program involving the three enterprises charged with implementing it: NUCLEBRAS, CNENE and Furnas."

Financial Disaster

"In addition to the great irregularities in the bids handled by NUCLEBRAS," the sources state, "the Brazilian nuclear program besides being ambitious

is being implemented in the NUCLEBRAS sector without assured funds and based on domestic and foreign short-term loans, which is a tremendous burden on the program in terms of financial costs."

NUCLEBRAS is almost bankrupt, according to the same sources. "The limit established by the government for NUCLEBRAS as regards taking out foreign loans, about $500 million, is not even enough to pay the service charge on the foreign debt, around $80 million (the foreign debt amounts to about $500 million). At the present time, the company's domestic debt amounts to about 5 billion cruzeiros, most of it in short-term bank loans."

The same sources relate that "the funds envisaged in the two basic sources, namely, Paragraphs I and N of the general price structure for oil derivatives, are not being completely released by the National Oil Council. Under Paragraph I, instead of 400 million cruzeiros per month, (the provision was that NUCLEBRAS would receive a total of 4.8 billion cruzeiros under this paragraph) only 150 million cruzeiros is being released; and under Paragraph N (energy mobilization program) which provided for 2 billion cruzeiros this year, NUCLEBRAS thus far has not received the funds. The funds derived from the single tax on fuels and lubricants, which are estimated at about 130 million cruzeiros for 1980, have also not been received.

Among the numerous irregularities that have occurred, according to the sources, NUCLEBRAS spent about 12 billion cruzeiros in 1979, exceeding the ceiling authorized by the Economic Development Council by 1.5 billion.

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NUCLEBRAS DIRECTOR RESIGNS OVER DIFFERENCES OF OPINION

Letter of Resignation Sent

Rio de Janeiro JORNAL DO BRASIL in Portuguese 21 May 80 p 23

[Text] NUCLEBRAS [Brazilian Nuclear Corporations] director Eduardo Calmon yesterday formally submitted his request for resignation from the enterprise in a letter delivered to Minister of Mining and Energy Cesar Cals in Brasilia. The resignation of Mr Eduardo Calmon--who was the director in charge of the uranium processing area in Pocos de Caldas--has already been expected for several weeks ever since the company's financial director, Vicente Costa e Silva also resigned.

In the letter delivered to Minister Cesar Cals, Mr Eduardo Calmon alleged differences as to investment policy and management policy pursued by NUCLEBRAS. Mr Eduardo Calmon, considered "an excellent technician" in NUCLEBRAS, will go into private industry. About ten technicians, who constituted his team in the company, will depart with him.

Increased Mining Dependence Feared

Sao Paulo FOLHA DE SAO PAULO in Portuguese 22 May 80 p 6

[Text] Sources in this sector announced that the resignation request submitted by NUCLEBRAS director Eduardo Calmon, who was in charge of the mineral processing and engineering area, was a consequence of "profound differences" relating to investment and administrative policies implemented by the company management, leading to increasing Brazilian dependence on foreign sources, particularly in the mining area, where there is a "destruction of technical memory" taking place.

Since, according to these sources, there is no planning and no definition of priorities within NUCLEBRAS, investments were made in NUCLEP [NUCLEBRAS Heavy Equipment, Inc] whereas the Pocos de Caldas project, for the production of uranium concentrates, was left aside. The result is that Brazil will now have to rent "yellow cake" from Argentina. That same absence of priority criteria caused investments in mining personnel training to have been wasted.

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BATISTA DEEMS SAFEGUARD ACCORD WITH IAEA IMPROBABLE

Sao Paulo FOLHA DE SAO PAULO in Portuguese 21 May 80 p 5

[Text] NUCLEBRAS [Brazilian Nuclear Corporations] President Paulo Nogueira Batista said yesterday in Rio in the course of a group interview that "we cannot rule out the possibility of a trilateral safeguard agreement between Brazil, Argentina, and the IAEA--but this is not being contemplated now." He added that there might be bilateral accords, which is most probable, or a trilateral accord but that the latter "normally comes about only in cases of very broad agreements, such as the one between the FRG and Brazil." He said that specific safeguards are provided in the industrial area, in connection with the supply of equipment, such as the equipment to be turned out by KWU [Power Plant Union] and NUCLEP [NUCLEBRAS Heavy Equipment, Inc] for the CNEA (National Atomic Energy Commission) of Argentina and accords will be worked out along these lines.

Pocos de Caldas

Nogueira Batista announced that the leasing by NUCLEBRAS of 240 tons of "yellow cake" from CNEA, according to the industrial cooperation protocol signed on 17 May, is intended to make up for the delay in the entry into operation of the uranium concentrate mill at Pocos de Caldas which will become operational only during the second half of 1981. He explained that the delay in the construction of Pocos de Caldas, where production was supposed to start this year, "was a consequence of the decision to review the basic project for the mine, with the intention of doubling its capacity, in view of the excellent results obtained during uranium prospecting and the determination of new reserves."

Pocos de Caldas will attain its originally anticipated output capacity of 550 tons per year only in 1982 and, after 3 years of operation, that capacity will be doubled. According to the protocol signed with CNEA, NUCLEBRAS will receive 120 tons per year in 1981 and 1982. "It is possible," said Nogueira Batista, that the CNEA might in the future import "yellow cake" produced in our plants "because Brazil will be self-sufficient in uranium."

The NUCLEBRAS president also said that NUCLEP will, in 1981, start manufacturing the Argentine reactor vessel for Atucha 2 but that this still depends on negotiations provided for in the protocol, to be carried out "before the middle of the year," concerning the precise definition of participation by the Brazilian enterprise.

Nogueira Batista explained that, in the case of Atucha 2, NUCLEP will act as the subcontractor of KWU.

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CNEN SAYS ANGRA WILL NOT HAVE ACCIDENTS LIKE U. S. PLANTS

Sao Paulo FOLHA DE SAO PAULO in Portuguese 21 May 80 p 5

[Text] Rio--CNEN [National Nuclear Energy Commission] President Hervasio de Carvalho said yesterday that there would be no accident at the Angra 1 nuclear power plant similar to those in the American power plants at Arkansas One, last Sunday, and Three Mile Island, in Pennsylvania, in March 1979, because Brazil's first reactor, supplied by Westinghouse, involves a different manufacturing procedure and because the cooling systems are also different. The reactors of the two damaged American power plants were built by Babcock and Wilcox.

"I do not as yet have any detailed information on Arkansas One," emphasized Hervasio de Carvallio, "but there is every indication that this involves problems concerning the safety valves and the pressurizer which failed to work properly. At Arkansas One, they did not have the sequence of errors that took place at Three Mile Island and they are therefore not going to have any problems. At Arkansas One, the reactor building was flooded with 200,000 liters of contaminated water due to the rupture of a cooling system pump."

"80 Times More Reliable"

The CNEN president said that, after the Three Mile Island accident, risk and safety calculations were made for Angra 1; this was recognized in the middle of 1979 by the United States Nuclear Regulatory Commission which congratulated him, saying that "the Angra 1 model is 80 times more reliable than the Three Mile Island model." Hervasio de Carvalho guaranteed that, after the accident, "all Angra 1 systems were completely checked out" and he ruled out any possibility that accidents in nuclear power plants might cause damage to the population: "We are using an in-depth defense system, visualizing the worst possible accident in a plant and setting up various protective barriers so that the population will not be hit."

As far as the CNEN president is concerned, "since there are reactors in operation, you are going to have accidents"; but in his opinion, "the development of nuclear energy is the one human activity with the highest safety index."

According to him, "at Three Mile Island there were no human victims. Nobody got sick or suffered damage, except for the psychological and emotional damage which spread in the United States due to lack of adequate technical information at the precise moment. The only victim was the scientist Edward Teller who had a heart attack while discussing the matter on television."

Paradox

In commenting on nuclear explosions for peaceful purposes, Hervasio de Carvalho referred to them as "a paradox" because it makes no sense to make a tremendous effort to isolate the irradiated materials from nature, which are already used in the reactors, and at the same time expel that material into nature through explosions, even peaceful ones.

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GOLDEMBERG SCORES MADERO COMMENTS ON NUCLEAR EXPLOSIONS

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 10 May 80 p 5

[Text] The physicist Jose Goldemberg, president of the SBPC (Brazilian Society for Science Progress), declared yesterday that "nuclear explosions for peaceful purposes are a euphemism for the development of nuclear arms because there cannot be any guarantee whatsoever that a nuclear bomb, once it has been made, will not be used as a weapon." He was talking about recent statements by Adm Castro Madero, chairman of the CNEA (National Atomic Energy Commission) of Argentina, in defense of nuclear explosions for peaceful purposes, in terms of "ship-building, shipping routes, optimization of the exploitation of petroleum and gas, etc."

After noting that the position of the Argentine military was rather "strange," Goldemberg explained that "from the technical viewpoint" this thesis is highly debatable. "It was considered about 20 years ago and it has never been put into practice for various reasons; it is difficult to find a civil engineering project where a huge nuclear explosion would be more efficient than a series of smaller conventional explosions. In the second place, the economy of this process is highly doubtful and, in the third place, nuclear explosions constitute a risk for the nearby population settlements as a result of the spread of radioactivity in the atmosphere which is not only prohibited but which is highly inadvisable," the scientist observed.

He recalled that nuclear independence provides a possibility of building nuclear arms. And he cited the case of India which exploded a bomb in 1974, clearly demonstrating that it completely mastered the nuclear fuel cycle and thus aroused suspicion among its neighbors and traditional rivals, such as Pakistan which is now desperately trying to produce arms. "Using the argument that this is done for the sake of peaceful explosions therefore is utterly childless or constitutes a deliberate provocation."

"In doing so, Adm Castro Madero forced Brazil's foreign minister Ramiro Saraiva Guerreiro to defend these explosions so that Brazil would not be in a position of inferiority," said Goldemberg, alerting us to the fact that, in this way, "a focus of nuclear dispute would be created in Latin America, such as it now exists between India and Pakistan."

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EUROPEAN DIPLOMATS CONCERNED OVER ACCORD WITH ARGENTINA

Sao Paulo FOLHA DE SAO PAULO in Portuguese 18 May 80 p 8

[Text] The nuclear cooperation accord between Brazil and Argentina, signed yesterday by presidents Figueiredo and Rafael Videla in Buenos Aires, is a matter which is causing much concern in diplomatic circles consulted in Brasilia. Defined as a bilateral accord, it is causing a somewhat tight diplomatic situation as other countries comment on matters that are exclusively within the competence and sovereignty of the two signatories.

The Atucha power plant, whose construction is already in the stakeout phase, will operate on German technology from KWU [Power Plant Union], the same German company that supplied the technology for the Brazilian project. The Argentine nuclear project is far along, in its implementation phase, as compared to the one in Brazil. During the meeting held by Brazilian members of parliament with members of the IEA, last year, in Vienna, an important Argentine official approached Senator Dirceu Cardoso and talked to him about this matter. But he was quite clear, according to a witness who was present, in asserting that "I may be called a patriot because of what I am going to say. But our project is 10 years ahead of the Brazilian one." He was talking about the establishment and construction of nuclear power plants.

When the first information came out, quite sketchy, by the way, on the agreement between Brazil and Argentina, the foreign offices of countries maintaining relations with Brazil began to become profoundly interested in this new event in Latin America's nuclear development.

Could this be a common step taken by the two countries in an effort to reduce the costs of nuclear programs now being carried out and, likewise by common accord, going in for their own manufacture of nuclear devices? The Germans--and this was noted by a person who is directly connected with the current phase of FRG assistance in the final implementation of the Brazilian project--exhaustively discussed the pledge concerning the exclusive use, for peaceful purposes, of the technology to be transferred, with the Brazilians, in very great detail.

The same source added that, so far, there had been no specific demonstration by Brazil regarding any intention to obtain nuclear arms for itself. The international context was mentioned as the second point justifying the calm German attitude: "Argentina and Brazil cannot--at least in the current situation--pay the political cost represented by the disturbance of the international panorama resulting from their getting into the atomic club."

But, to stick to the reality represented by possession of the complete nuclear technology cycle, the source said that "the pledge not to use, for military purposes, the technology to be transferred does worry us and did worry us. In the final analysis, we are responsible for that technology."

Within the entire discussion on the nuclear accord between Brazil and Germany, the Germans did not conceal their profound displeasure over United States stubbornness which they called inadmissible at this point in time, that is to say, the ban on the transfer of key technology. Nuclear energy, this high source explained, "is a key technology. Technological monopoly is a part of its policy (the policy of the United States)."

There is almost total ignorance on the accord among certain Brazilian political sectors which are directly involved in the nuclear problem. It has already been announced that NUCLEBRAS [Brazilian Nuclear Corporations] President Paulo Nogueira Batista will be questioned directly on this matter during the next meeting of the Senate Nuclear CPI [Congressional Investigating Committee] in June.

The European countries think that cooperation between Brazil and Argentina is a positive thing; they believe that it is irreversible and that it should be welcomed on the international scene. And they explain that the simple possession of a nuclear bomb does not imply an overall defense policy. What about the infrastructure? What about the launch devices? Brazil and Argentina cannot think in terms of the British or French solution ("striking force") because, according to European diplomats, that would be a total strategy in dealing with the policy of the two blocs.

But the possession of nuclear devices in an autonomous manner, such as, for example, in the case of India, does terribly complicate the international panorama. The fact that Brazil and Argentina did not sign the NPT is causing much real concern among various European countries. "These two countries are not subjected to the provisions of that treaty. It can be disregarded and that would be a violation. It is logical that the Brazil-Argentina agreement should worry Europe which has the Soviet Union behind it and the United States interest in front of it."

At no time did the sources consulted indicate any criticism of the use of nuclear energy for peaceful purposes. But the simultaneous declarations by both foreign offices as to the possibility of explosions at least caused worry, although they did not exactly frighten anybody. Still, a nuclear explosion always recalls the A-bomb automatically.

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MME COMMENTS ON INCREASED PLUTONIUM YIELD OF PWR REACTORS

Rio de Janeiro JORNAL DO BRASIL in Portuguese 19 May 80 p 13

[Text] Brasilia -- PWR-type reactors (using pressurized water and enriched uranium), which Brazil is building with German technology may find their plutonium production capacity increased by more than 50 percent and may be turned into a new type of reactor with an efficiency close to that of the breeders. The uranium economy is also increased here.

This disclosure was made by a technician from the Ministry of Mining and Energy on the basis of information received from the Karlsruhe Nuclear Research Center in Germany. According to the information, research on the development of the advanced PWR was conducted by the Karlsruhe Research Center with KWU (Power Plant Union). Reactors already in operation or under construction can also be modified.

Basically, the technique developed by the Germans consists in planning a more concentrated nucleus for the reactor. The only disadvantage deriving from the new nucleus is that the uranium, which is used as fuel, must be enriched to the extent of 8 percent, as against between 2.5 and 3 percent for the conventional PWR. It is possible that the jet nozzle enrichment process, which Brazil is importing from Germany, does not offer any economic efficiency in terms of enriching uranium to that content, the technician added. The new reactor's fuel elements will also have their format modified from square to hexagonal which will permit a better fit between one and the other and greater fuel concentration.

In a PWR, the average conversion of uranium 238 atoms into plutonium is 0.6 for each atom of uranium 235 fissioned. This means that there is no reproduction and the reactor, when in operation, consumes more fissile elements than it produces. The opposite happens in the breeder reactor. Its conversion rate or, in this case, reproduction rate, is above 1. This means that, for each U-235 atoms split, more than one atom of U-238, on the average, is converted into plutonium. The conversion rate of the advanced PWR reactor is 0.9 and it is therefore in between the conventional PWR and the breeder.

The Ministry of Mining and Energy technician added that the new reactors can be used commercially, according to information received from Germany, long before the breeders, thus improving the efficiency of conventional reactors in the utilization of uranium available during this intermediate phase. While a conventional PWR of 1.3 million kilowatts, like those Brazil is building, produces about 300 kilograms of plutonium per year, the new type can produce 450-500 kilograms per year of PU-239 and PU-241--fissile materials which can be used in reactors or as nuclear explosives.

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FRENCH TECHNICIANS ASSUME CONTROL OF POCOS DE CALDAS PROJECT

Sao Paulo FOLHA DE SAO PAULO in Portuguese 19 Apr 80 p 5

[Text] Rio--By decision of the president of the Brazilian Nuclear Corporation (NUCLEBRAS), 10 technicians from the French Societe de Cycle de L'uranium Pechiney Ugine Khulmann group arrived in Brazil last week and assumed charge of implementation of the Pocos de Caldas uranium extraction and beneficiation project, area sources reported yesterday.

As a consequence of the arrival of those technicians and the nature of their participation, the demobilization of the team of Brazilian technicians responsible for carrying out the project began, as did the practical (though not yet formalized) detachment of several engineers and chiefs of some sections of the project.

The arrival of the technicians from the Pechiney Ugine Khulmann group, for whom NUCLEBRAS immediately released an initial appropriation of 660,000 cruzeiros for the expenses of their stay, is considered completely unnecessary from both the technical and financial points of view.

According to NUCLEBRAS sources, the team of Brazilians that headed the implementation of the project was formed during 5 years of training and work, with an apprenticeship abroad, including France. The breakup of that team and control by the French, according to the sources, means the loss of an important bastion of national technology for the Pocos de Caldas project and for the Brazilian nuclear program. To make matters worse, there is the climate of insecurity generated by the mass dismissals in NUCLEBRAS, which practically cut in half the personnel of the Superintendency of Beneficiation and Mineral Engineering, which encompasses the Pocos de Caldas project.

Review

The official justification presented for the intervention of the French, decided directly by the president of NUCLEBRAS, was the review of what has already been done in Pocos de Caldas--the project is in the final phase of assembly of the equipment--to insure the guarantee requirements signed into the contract, otherwise the Pechiney Ugine Khulmann group would disavow its obligation for those guarantees.

In the meantime, according to the sources, the review work could have been done by Brazilian technicians without the presence of so many French technicians and, especially, retaining control of implementation of the project. In addition, the Pechiney technicians will remain in Brazil to double the Pocos project, the production capacity of which is 500 tons per year of uranium concentrate.

From the financial point of view, according to the sources, the arrival of the French technicians is intended merely to justify the expenditure of the optional financing of $1,508,000 signed by NUCLEBRAS with Pechiney on 13 August 1976 and which would only be used, according to NUCLEBRAS itself in an official note dated 31 March, if the mining method to be used at Pocos de Caldas were to be underground. (The real amount of the optional financing signed at that time was $1,974,000.)

Units 4 and 5

The special steel and forgings for the manufacture of components for Units 4 and 5 of the Brazilian nuclear program have already been released after the payment of 75 million cruzeiros freight and storage charges. The raw material was transported in four ships that began to arrive in Rio de Janeiro in mid-February.

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FOURTH PLANT MAY BE INSTALLED IN SAO PAULO STATE

Sao Paulo FOLHA DE SAO PAULO in Portuguese 9 May 80 p 5

[Text] Rio--Minister of Social Communication Said Farhat revealed in Itaguai yesterday that President Figueiredo has instructed the Minister of Mines and Energy to study the electric power generation system in the state of Sao Paulo within a period of 30 days with a view to insuring satisfactory energy supply conditions for the next 30 years. The minister did not deny the possibility that the fourth nuclear plant might be installed in that state.

Minister of Mines and Energy Cesar Cals declared that site of the fourth nuclear plant depends on a decision by Figueiredo, who already has the information presented by his minister.

Asked about the possibility of the fourth plant being installed in Sao Paulo, Farhat limited himself to repeating that "the decisions of the president were intended to insure the supply of electricity for Sao Paulo" without specifying what means might be used.

The revelation was made after the inaugural ceremony of the NUCLEBRAS Heavy Equipment Corporation (NUCLEP), presided over by President Figueiredo, who arrived in Itaguai at 1300 hours after fulfilling other official commitments. The president was received in the courtyard of the new factory by German Ambassador Jorg Kastl and NUCLEBRAS President Paulo Nogueira Batista, who delivered a speech. Following that, Figueiredo unveiled a commemorative plaque, attended a luncheon and toured the NUCLEP facilities, leaving for Brasilia at 1600 hours.

Concessionaire Later

Cesar Cals, who was a member of the president's retinue, did not want to reveal the place suggested by his ministry as the site of the fourth nuclear plant. "We are waiting for President Figueiredo to determine the place on the basis of the data presented. Only after that will we select the concessionaire to build the plant," the minister said.

According to the minister, several agencies of the ministry were consulted before a definitive suggestion could be presented to the president. He revealed that the equipment for the fourth plant will begin to be produced by NUCLEP even before the site and the concessionaire that will be charged with construction have been determined.

Businessmen React

In a protocol signed yesterday with the Brazilian Basic Industry Association (ABDIB), NUCLEP pledged that it will enter into the manufacture of equipment other than heavy components for nuclear electric plants only when it is ascertained that it cannot be done by other industries subcontracted by national companies.

The great majority of the industrialists connected with the production of heavy equipment made it clear that the government's intention in signing the agreement with ABDIB was simply to avoid protests by the private sector. "At least we signed a protocol guaranteeing that NUCLEP will not be a competitor," said ABDIB President Valdir Antonio Gianeti.

According to him, the government alleges that NUCLEP has much more sophisticated equipment that private industry does not possess, "which is also not true." According to Gianeti, what occurs is "demand peaks, which is not the case now." The greatest proof of that, according to him, is the industry's rate of idle capacity at the present time, around 45 percent, and the entry of NUCLEP will aggravate that problem even more.

FRG Will Fulfill Agreement, Asserts Ambassador

Rio--German ambassador to Brazil Jorg Kastl said in Itaguai yesterday, during the inaugural ceremony of the NUCLEP factory, that his country is going to fulfill all the items of the nuclear agreement signed with Brazil.

The ambassador said that "Germany is going to fulfill all agreements with Brazil." He added that there is no problem between Germany and Brazil regarding the agreement and "we continue to fulfill it together with our Brazilian friends."

According to Jorg Kastl, the delays in the timetable of the projects for the first two plants will not hurt the agreement at all. With regard to speculation that his country is using those international agreements to build a nuclear bomb outside Germany, the ambassador said categorically: "We have signed many international agreements but that would be political, military and actual suicide."

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CDE APPROVES 2 BILLION CRUZEIRO LOAN FOR NUCLEBRAS

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 1 May 80 p 28

[Text] Brasilia--In anticipation of the receipt of funds, the Economic Development Council (CDE) approved and the president of the republic authorized a loan of 2 billion cruzeiros for the Brazilian Nuclear Corporation (NUCLEBRAS), according to the chairman of the nuclear congressional investigating committee, Senator Itamar Franco (Brazilian Democratic Movement Party--Minas Gerais). He expressed misgivings about "those funds being used for the venture of building the fourth nuclear plant when the second is not ready and the definite site of the third has not even been chosen."

In the meantime, Senator Dirceu Cardoso (Espirito Santo) saw Justices Luciano Brandao and Mauro Renaut Leite of the federal Court of Accounts (TCU) to discuss the most efficient way for the senate to oversee all of the projects carried out by the government. It was agreed that all requests for information will be forwarded to the officers of the senate, which will assume responsibility for officially presenting them to the court.

At yesterday afternoon's meeting, there was general agreement between Senator Dirceu Cardoso and the justices of the TCU with regard to overseeing the projects carried out by the government. It was also agreed that next Wednesday, Dirceu Cardoso will submit several petitions to the officers of the senate, requesting information about the Angra-1 and 2 nuclear plant projects.

Senator Dirceu Cardoso said that he has not given up asking for an audit of Furnas but before that measure he is going to submit a request for information because he doubts "the veracity of some of the data furnished by the president of that agency, Licinio Seabra."

Senator Itamar Franco said that in the justification of the request for a loan from the Savings Bank [Caixa Economica], NUCLEBRAS stated that of the "15,118,600,000 anticipating the source of budget funds, coordination is not proceeding at a rate compatible with requirements." He added that the bank has already authorized the financing, which will be guaranteed by the national treasury.

The Minas senator revealed also that next Tuesday the members of the nuclear congressional investigating committee will meet with the vice president of the republic, Aureliano Chaves, to invite him to speak before the group on Thursday. Afterwards, the president of NUCLEBRAS, Paulo Nogueira Batista and Minister Cesar Cals will be invited to testify, and the work of the committee will be concluded with the presentation of Senator Milton Cabral's report.

The Brazilian Government plans to slow down the country's nuclear program, and not build a fourth plant in addition to the three at Angra dos Reis. The revelation was made yesterday at the plenary session of the senate by Senator Almir Pinto (Social Democratic Party--Ceara), who is the acting alternate for Mines and Energy Minister Cesar Cals.

The parliamentarian was participating in a debate with Senator Itamar Franco (PMDB-MG) and when he referred to the NUCLEBRAS program, which had been criticized by the Minas representative, he said that in a recent conversation with Cesar Cals "he told me about a deactivation of the nuclear program."

According to Almir Pinto's short report, the possibility of the construction of the fourth nuclear plant depended on a drop in the inflation rate "but since that drop is not taking place, we cannot consider a fourth nuclear plant."

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NORTHERN SAO PAULO COAST GIVEN PRIORITY FOR FUTURE PLANT SITES

Plant Site Priority Discussed

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 20 May 80 p 26

[Text] Rio--The fourth and fifth nuclear power plants will have to be set up along the northern shore of the state of Sao Paulo, according to the first priority established in the studies conducted by ELETROBRAS [Brazilian Electric Power Companies, Inc]. According to the document, second priority goes to the littoral region in the Ribeira valley, including Iguape, Cananeia, up to the boundary of the State of Parana.

ELETROBRAS president Mauricio Schulmann gave assurances that the company at this time is not working on any new study dealing with the site location of nuclear power plants--a study which had been prepared earlier anyway. In addition, ELETROBRAS technicians also believe that the selection of the site for the next nuclear power plant should follow the recommendations in the studies drafted by Barbalho, since no other research has been done along these lines.

The ELETROBRAS nuclear power plant site selection study calls for the establishment of twin power plants--Sao Paulo I and II--which would be integrated into the electric power systems of the Paraiba valley and the northern shoreline of the State of Sao Paulo. Thus, the next power plant might be built in the region of Obatuba, Caraguatatuba, Ilha Bela or Sao Sebastiao, in line with the first-priority recommendations.

Looking at the second priority, the fourth nuclear power plant coult be built in the littoral region of the Ribeira valley or, in other words, Iguape, Cananeia, up to Ponta de Camboriu, on the border with the State of Parana.

The ELETROBRAS study furthermore recommends the adoption, during the planning process, of a probable deadline of 12 years for the entry of the 1,245-Megawatt power plant into commercial operation, while the following units could be reduced to a minimum of 10 years. Out of that total, actual construction would normally take 8 years. The study, definition, and site approval phases, including the preparation of safety analysis reports, selection of contractors

and suppliers, preparation of support facilities, construction of work sites and foundations would require an additional time of 2-4 years.

The study prepared by ELETROBRAS also stresses the need for considering realistic deadlines in order not to influence the construction costs improperly and in order not to create any risk as to the proper supply of the market due to any delays in the construction work as such.

The study on the placement of nuclear units in addition to the three power plants at Angra dos Reis does not figure on having any more nuclear power plants by the year 2000. "The expansion of the Brazilian electric power system, within that horizon, can be based exclusively on hydroelectric resources which may or may not be combined with thermal power resources based on coal."

Nuclear Power Plant Protests

Sao Paulo FOLHA DE SAO PAULO in Portuguese 21 May 80 p 5

[Text] Reports to the effect that the government was about to decide on the placement of the next nuclear power plant along the shores of the State of Sao Paulo triggered protests from the Fourth Congress of City Councilmen in Caraguatatuba, by the population of Iguape and Jose Goldemberg, president of the Brazilian Physics Society, in Rio.

According to our special correspondent, Gastao Thomaz de Almeida, the Fourth Congress of City Councilmen at Caraguatatuba condemned the establishment of nuclear power plants without the approval of the state legislature, proposing that each state draft legislation on this point.

On this occasion, all city councilmen from the northern shore of Sao Paulo present at the congress submitted a protest motion to the full assembly against the news to the effect that a nuclear power plant would be built in the region. One city councilman from the Northern Shore thought that it would be better if one were to decree an end to the fishing industry, to community life, and to tourism in that area. The city councilman from the Northern Shore promised to launch a broad protest movement.

The full meeting of the congress unanimously approved the thesis of the Sao Jose delegation to the effect that the states,the municipalities, and even the population should express themselves on energy problems (specifically, nuclear energy). According to the proposal which was approved, the decision on the placement of nuclear power plants can be taken only through a bill to be passed by the state assembly.

Although they admitted that the question of supplying energy should remain under federal authority, the authors of the thesis argue that "the nuclear

option goes beyond the mere supply of energy and it is precisely the recognition of the risks inherent in nuclear technology which is provoking this tendency toward growing community participation. More than that, it is now becoming necessary not only to have growing participation but also to give the population the veto right."

Talking the day before yesterday at the Fourth Congress, professor Aziz Ab'Saber said that "only surreptitious interests support the nuclear plan." He added that " the nuclear accord goes forward to the tune of $30 billion in gold--which we do not have in the first place--while hydroelectric power plant construction projects are being suspended for its sake--in other words, projects which do not pollute, which are more economical, and for which Brazil already has a technology of its own that can be used in building them."

The point on the agenda for today involves the topic of extending the municipal terms of office.

Iguape Mobilizing

Crowded with students, businessmen, workers, and self-employed individuals, the City Council of Iguape held a special protest meeting against the installation of a nuclear power plant in that township, as announced the day before yesterday by a technician from the National Nuclear Energy Commission.

Under banners reading "Down With the Nuclear Power Plants" and "Green River Valley--We Want It to Remain Green," various speakers sounded off. The most eloquent, attorney Paulo Barreiro Junior, deplored the fact that "Brazil unfortunately wants to make a huge leap in terms of space by not utilizing its natural resources."

While a signature petition was being circulated throughout the township, the deputy mayor Laercio Ribeiro will tomorrow appoint a committee to organize the continuation of the protest movement. Early in June, the city will stage the first parade against the establishment of the power plant.

Brazilian Science Progress Society Opposed

The physicist Jose Goldemberg, president of the Brazilian Society for Science Progress, said yesterday in Rio that the installation of two nuclear power plants along the shores of Sao Paulo "is completely out of the question since studies released by NUCLEP [NUCLEBRAS Heavy Equipment, Inc] as being feasible were prepared 10 years ago and were then abandoned by the state government."

Goldemberg emphasized the fact that the news of the installation of the power plants "is bound to be another trial balloon released by the government." He recalled, in justifying his viewpoint, that it takes at least 8 years to build a nuclear power plant; "it is only the political situation at the time which can decide on the convenience of building power plants anywhere, other than along the shore of Sao Paulo."

The physicist recalled that, at the time when the feasibility studies for the construction of nuclear power plants along the shoreline of Sao Paulo were prepared by the United States Kaiser firm on request of CESP [Sao Paulo Electric Company], the politicians came out against the project. "By a majority," Goldemberg recalled, "the Constitution and Justice Committee of the Sao Paulo Assembly approved a constitutional amendment, prohibiting the construction of that type of power plant, considering primarily the risks which it would create for the entire shoreline of Sao Paulo."

As far as the president of the SBPC [Brazilian Society for Science Progress] is concerned, nuclear energy "is not as yet as urgent as the government wanted to make us believe in 1975. This is why I think that the construction of two nuclear power plants in the region of Ubatuba, Caraguatuba, Ilha Bela, or San Sebastiao is a real outgrowth of delirium."

"Speculation"

NUCLEBRAS president Paulo Nogueira Batista in Rio termed "pure speculation" the assertion to the effect that the fourth nuclear unit would be located in Sao Paulo. Trying not to make any statements prior to the decision by the federal government, Nogueira Batista almost exactly duplicated the behavior of CNEN [National Nuclear Energy Commission] director Rex Nazare Alves who said a few days ago that it is "very probable" that the fourth and fifth units will be built in Sao Paulo, without specifically indicating the place.

New Resignation

NUCLEBRAS director Eduardo Calmon, responsible for the mineral processing and engineering area, submitted his request for resignation from his job to Mining and Energy Minister Cesar Cals in Brasilia.

Calmon, whose area of responsibility was recently cut back 43 percent in terms of personnel, is the second enterprise director to request resignation in less than a month. He was preceded at the end of April by Vicente da Costa Silva, who was in charge of the financial area. It was learned that the primary motive for the departure of these two directors was incompatibility with the administrative and financial policy of NUCLEBRAS President Paulo Nogueira Batista.

Nuclear Power Plant Study Reviewed

Rio de Janeiro JORNAL DO BRASIL in Portuguese 22 May 80 p 23

[Text] CESP (Sao Paulo Energy Company) is reviewing the studies conducted in 1974 and 1975 by the engineering firm of Milder Kaiser on the Southern Shore of Sao Paulo with a view to the possibility that this region might be chosen by the federal government for the installation of the next two nuclear power plants, Mr Durvaldo Guimaraes, director of the nuclear engineering department of CESP, announced in Rio yesterday.

The area covered by the CESP studies extends from the township of Santos to the township of Ariri; the latter is located in the far south of the Sao Paulo shoreline, right on the border with Parana. Mr Durvaldo Guimaraes emphasized that, so far, no official decision has been made regarding the placement, in the State of Sao Paulo, of the fourth and fifth nuclear power plants (the third and fourth under the nuclear accord with Germany) but CESP is already getting ready for the possibility of getting an order to build the power plants.

According to the director of the CESP nuclear engineering department, the enterprise is technically able to build nuclear power plants although he believes that "the optimum preparation time for an enterprise for this kind of task is 15 years."

Representatives from the public relations office of the Ministry of Mining and Energy and energy companies connected with the ministry (ELETROBRAS, NUCLEBRAS, and FURNAS) met yesterday in Rio with representatives from SECOM [Mass Media Secretariat] to discuss the campaign which FURNAS is preparing for publicity on the Angra-I nuclear power plant which will go into operation at the end of this year or the start of next year. The drive is aimed at sensitizing public opinion for the power plants although in its final phase it will seek to reach the technicians who build and are going to operate Angra-I.

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BRIEFS

NUCLEP PLANT INAUGURATED--Brasilia--On 8 May, President Joao Figueiredo will preside over the ceremony marking the opening of the NUCLEBRAS Heavy Equipment Corporation (NUCLEP) factory in Itaguai, in Rio de Janeiro, the Ministry of Mines and Industry announced yesterday. Construction of NUCLEP, a NUCLEBRAS subsidiary representing an investment of approximately $300 million, began in February 1977. It will have the capacity to produce a complete assembly of the nuclear steam generation system annually. The project envisages expansion of the production capacity to three assemblies annually. NUCLEP will supply some equipment for Angra-2 and 3 and the principal equipment for Unit 4, the location of which is to be determined during the first half of this year. The size of NUCLEP is one of the items in the Brazilian-German nuclear agreement that has been the subject of frequent criticism. The company is going to operate with idle capacity because with the slowdown of the nuclear program, there will not be sufficient domestic demand to absorb an assembly of the nuclear steam generating system. The option will be the foreign market, but thus far the company has not yet received any order. [Rio de Janeiro O GLOBO in Portuguese 6 May 80 p 23] 8711

NUCLEBRAS CONTRACT WITH FURNAS--Rio--Furnas Electric Power Stations reported yesterday that the contract it will sign with NUCLEBRAS and NUCLEP for the manufacture of some equipment for the Angra-3 plant, including the pressurizer, is already being prepared. It is possible that the contract will be signed tomorrow at the inauguration of the NUCLEP factory in Itaguai. The equipment was supposed to have been supplied by Kraftwerk Union, according to the contract signed in 1976 between Furnas and the German company but with the delay of the beginning of the Angra-3 project, there will be time, according to sector officials, to transfer its manufacture to NUCLEP. NUCLEBRAS reported yesterday that a protocol will be signed tomorrow with the Brazilian Basic Industries Association (ABDIB) defining the possibilities of collaboration between private industry and NUCLEP, as the result of studies that have been conducted for some time by a committee appointed by NUCLEBRAS and ABDIB. Minister of Mines and Energy Cesar Cals and Minister of Industry and Commerce Joao Camilo Pena will be present at the inauguration of the NUCLEP factory. [Sao Paulo FOLHA DE SAO PAULO in Portuguese 7 May 80 p 6] 8711

MINING PROJECTS INCLUDE EXPLORATION FOR URANIUM

Lusaka TIMES OF ZAMBIA in English 10 Jun 80 p 2

[Text]

THE Government has invested nearly K500,000 into minerals prospecting throughout the country.

The projects include further exploration for uranium, according to principal geologist Mr Derek Green.

The programme covers coal prospecting in Western Province and workable prospecting for uranium on the Copperbelt.

Some foreign companies have already obtained contracts with the Government for the working of uranium deposits in the country.

Areas in which the geological department will carry out its surveys during the period from this month to December were gazetted last Friday in which the attention of holders of surface rights in those areas was drawn to the Mines and Mineral Act of 1976.

Along the Old Mumbwa Road, the department is searching for zinc and silver.

Mr Green said that in the Choma area, following small workings of tin by local people, the department was trying to find better deposits and a Government geologist was in the area helped by an Italian prospecting company.

Kaimbwe in Kasempa is earmarked for salt explorations this year following investigations in the Luapula Province. The department is sending a technician to the province to determine the quickest method of mining salt.

Mr Green said the department would have liked to embark on more projects like gold prospecting but lack of geologists had prevented this.

Exploration of the minerals was important for Zambia's energy requirements.

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CANADA TO SELL URANIUM TO FRANCE

Paris LE MONDE in French 24 May 80 p 40

[Report by Dominique Dhombres]

[Text] "Canada will soon be selling uranium to France," declares the Ottawa government's energy minister.

On Thursday, 22 May, in Paris, Mr Marc Lalonde, Canadian energy minister, took part in the meeting of the International Energy Agency. Mr. Lalonde, a Quebecker (selective service deputy of Outremont, a suburb of Montreal), and one of Mr Trudeau's oldest friends, met on Thursday with Mr Giraud, industry minister, to whom he affirmed Canada's willingness to sell uranium to France in the future. The Canadian minister is going this Friday to Algiers for a two-day visit. While he was in Paris, he allowed us to interview him on matters concerning his department.

[Question] Mr Trudeau has indicated that, after the independentists' failure in the Quebec referendum, it was time to negotiate with the provinces. Does this extend to the area of energy?

[Answer] He said that all the cards were, in fact, on the table. But that concerns the powers of the provinces, not just ours. Some provinces have shown a desire to have their energy resources better guaranteed. Alberta takes the extreme position, Saskatchewan a little less so, Newfoundland likewise maintains that its underwater mining beds are under its sole authroity.* It is, however, necessary for the central government to have powers that are strong enough to be able to preserve a national policy which is not dictated by one or two provinces.

[Question] What does the Constitution (The North American Act [1867] and the statutory law of the Supreme Court) say on this question?

* Alberta produces 85 percent of the petroleum of Canada, which is itself 60 percent self-sufficient. Research which has not yet been completed but which appears promising is being conducted in the waters along the island of Newfoundland.

[Answer] There is no doubt that natural resources belong to the provinces, but the Federal government has the right (even if it does not necessarily use it on every occasion) to legislate or regulate, once a provincial border is crossed. Thus, since 1973-74, we have a single price (adjusted according to transport costs) for all of Canada.

[Question] In what why does the central government impose itself?

[Answer] Very little. The province gets 45 percent and we get only 10 percent of every Canadian dollar of oil sold. On the other hand, there is a very high export tax because it equals the difference between the domestic and international price. Thus, it can reach 15 dollars, but the amounts exported areeminimal.

[Question] Alberta puts 30 percent of its revenues from oil and gas into a special savings account, the Heritage Fund, for "future generations" of the provinces. From this time on, that involves considerable amounts of money. Does Ottawa have the right of supremacy over this money?

[Answer] Not at all. They can freeze it in a bank or buy oil wells in Saudi Arabia if they have a notion to.

[Question] The conservation government has "fallen" because of the 18 cent per gallon tax which it has proposed for gasoline. For its part, Alberta is pushing for an immediate increase designed to catch up with world prices. What are you going to do?

[Answer] The calendar has been set down but I cannot reveal it now. The price of oil on domestic markets is currently 14.75 dollars per barrel. For this year, the increase will be less than four dollars. In any case, the increase will be less than that anticipated by the conservatives for the next four years, and thus prices will remain quite a bit lower than the general trend.

[Question] A French capital consortium, Amok, has begun mining uranium in Saskatchewan. Up to now, France has not been able to buy this uranium, with Canada not considering sufficient the assurances that it would not be used for military purposes. Where do you stand now?

[Answer] I had an excellent meeting with Mr Giraud. The problem will be settled in the weeks to come, since France is on the verge of signing a three-party agreement with EURATOM [European Atomic Energy Commission] and the Vienna Agency. From then on, France will be treated on an equal ground with the United States, and will be able to buy uranium from us. The inspectors from the Vienna Agency will employ the necessary controls.

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CHANGES IN WASTE MANAGEMENT PRINCIPLES FOR NUCLEAR POWER PLANTS

Duesseldorf ATOMWIRTSCHAFT ATOMTECHNIK in German No 5, May 80 pp 240-41

[Text] With the publication of the modified regulations for the disposal of nuclear power plant waste on 29 February 1980, the government and the Laender have created the legal prerequisites for disposal of atomic waste to be used in future authorizations for construction and operation of nuclear power plants. The regulations take into account the new disposal concept which was agreed to on 28 September 1979 by the Federal and Laender government heads.

The "Regulations for Planned Waste Disposal for Nuclear Power Plants" adopted on 6 May 1977 by the heads of the Federal and Laender Governments and which is to be used by the states in applying Article 7, Paragraph 2 of the Atom Law during the authorization process for nuclear power plants, suspended domestic disposal until progress on the planned integrated disposal center in Lower Saxony (Gorleben) is realized.

On the Newly-Conceived Disposal Concept

Following the decision of the Land Government of Lower Saxony on 16 May 1979 to cease pursuing this project for political reasons, the heads of the Federal and Laender Governments, in a resolution of principle on the disposal concept again confirmed and strengthened the notions that guaranteed, safe disposal of nuclear power plant waste is one of the indespensable prerequisites for the further utilization and further limited expansion of nuclear energy, that the reprocessing of spent fuel elements with recycling of the unspent nuclear fuel and permanent storage of the reprocessed waste can be safely accomplished with current science and technology and that the required storage of nuclear power plant waste be guaranteed from the standpoints of ecology and economy. The work toward realizing this integrated disposal concept is to be carried forward without being tied to a single location.

Note: This article reflects the personal interpretation of the author.

Simultaneously, other methods of disposal such as, for example, the direct, final storage of spent fuel elements without reprocessing are also to be investigated with respect of safety and realizability.

These studies shall be finished early enough that final judgment will be possible in the mid 1980's as to whether or not decisive safety advantages will result from the integrated disposal concept. The reconnaissance and opening of the Gorleben salt domes by miners for permanent storage will be carried out within the framework of the present planning process so that the required information concerning the salt domes will be available for the decisions which will have to be made in the second half of the 1980's. The above-ground processing installations for either of the disposal methods and the national facilities for assuring permanent storage of radio-active waste are to be operational by the end of the 1990's at the latest. In the interim, intermediate storage capacity is to be expanded, with compact storage facilities contributing to this end.

The newly-conceived disposal concept thus establishes in place of the integrated disposal center--which in actuality has not been forthcoming--a program consisting of smaller individual, but from the beginning more practical, steps within the framework of a plausible overall concept wherein the individual steps are more directly borne by the states interested in atomic energy while at the same time making possible a more flexible adaptation to the regional disposal requirements.

The New Prerequisites for Authorization

On 29 February 1980, following preliminary work of the Federal/Laender Committee for Atomic Energy, Federal and Laender government leaders amended the disposal regulations in harmony with their basic accord of 28 September 1979 in those aspects which hinge on process in realizing the integrated disposal project at Gorleben. Basically, the changes provide that in basing planned disposal upon the realization of the integrated disposal concept or upon other disposal methods, the initial construction authorization for nuclear power plants will in the future be coupled with the following prerequisites:

--Preselection of one or several basically satisfactory intermediate storage locations when intermediate storage is not assured at the nuclear power plant site

--Review and certification by the Reactor Safety Commission and the Radiation Protection Commission that the fundamental safety provisions of the intermediate storage facilities will be adequate for a period of at least 20 years

--Continuance of certification by the Reactor Safety Commission and the Radiation Protection Commission of the realizability of basic safety provisions for the installations for carrying out the integrated disposal concept as established on 20 October 1977 within the framework of planning for the disposal center at Gorleben

--Continuation of the current planning process for final disposition of radioactive residue and of progress in the reconnaissance and opening of the Gorleben salt dome.

An additional prerequisite for initial limited construction authorization and operational authorization which becomes effective after 1 January 1985 is preselection of one or several installations for reprocessing or for treatment of spent fuel elements for final storage without reprocessing. For operational authorizations of nuclear power plants which already had an initial, limited construction authorization on 28 September 1979--the day of the basic agreement on the disposal concept by the government leaders--this requirement becomes effective after 1 January 1986.

Adaptation of the disposal principles couples the newly-conceived disposal concept, considering nuclear safety and overall economic balance, with the requirements of disposal planning in the authorization process for nuclear power plants. In particular it controls the time phasing of research on various disposal methods and progress in preparation of the final repositories with the requirements for practical disposal steps and clarifies the role of intermediate storage and its function as an intermediate link in the disposal chain. With this, the Federal government and the Laender have, with due deliberation, created the legal prerequisites for disposal to be applied in future construction and operation authorization for nuclear power plants.

Status of Atomic Waste Disposal

Corresponding practical disposal steps have been initiated or are slated for the near future:

--Intermediate storage of spent fuel elements: In this connection, the North Rhine-Westphalian Land Government has confirmed its basic readiness to take on a regional intermediate storage facility during discussions between government leaders on 28 September 1979. Authorization is being processed.

The Land government of Lower Saxony has likewise declared its readiness to accept a regional intermediate storage facility; site selection will be accomplished in the near future.

In March 1980 authorizations were granted for several compact storage facilities at nuclear power plants. Additional authorizations are being processed.

The Reactor Safety Commission and the Radiation Protection Commission have certified the technical realizability of intermediate storage safety for the time period required by the disposal concept.[1]

--Reprocessing of spent fuel elements: In this connection, a request for authorization was submitted by the German Society for Reprocessing Nuclear Fuels mbH (DWK) on 25 February 1980 in Hesse for an installation

considerably smaller than the Gorleben project but large enough to significantly contribute to the disposal of nuclear power plant waste. The initial request did not specify the location which will be made at a reasonable future date. This site selection is not legally tied to the general study on capacity and site selection criteria for reprocessing installations which the Federal and Laender leaders agreed to in their resolution of 28 September 1979 to provide--without knowledge at the time of the request to be submitted in Hesse--provisional support to the states for their site selection planning.

Studies relating to dual Federal/Land waste disposal facilities have been started.

--Final Storage of Radioactive Waste: Planning is underway on the permanent national repository for atomic waste; hydrogeological research and deep drilling operations have been started.

Closing Note

The text of the revised disposal regulations[2] has been transmitted from the Federal Minister of Interior to the chief state official responsible for its application in the authorization process for nuclear power plants, following the procedure used to distribute the first compilation in 1977.

It is noteworthy that the final report of the International Conference on Evaluation of the Fuel Cycle (INFCE), which investigated the technical questions relating to the fuel cycle during a 2-year information exchange among 77 countries, adopted the German disposal concept in its standards in March 1980.

FOOTNOTES

1. Public notice in the Federal Registry, No 42, 29 February 1980, p 2

2. Public notice in the Federal Registry, No 58, 22 March 1980, p 2

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REACTOR PREMISES BECOME NUCLEAR STORAGE SITE

Paris LE MONDE in French 2 May 80 p 18

[Text] The Pegasus Reactor is Converted to a Temporary Storage Center for Radioactive Materials.

Through a decree which appeared in the OFFICIAL JOURNAL of 27 April, the Atomic Energy Commission has received authorization to create, on the nuclear site of the Pegasus reactor (Bouches du Rhone), a temporary installation for the storage of irradiated fuels and radioactive substances and materials.

This new storage center will be set up on the basis of certain elements--pool, storage basin--of the "Pegasus" research reactor which stopped functioning for good in 1975 after 12 years of gainful use, in particular for the development of from graphite gas-stock. The cost of the work undertaken for the adaptation of these installations will amount to a total of 10.5 million francs: 8 million francs for dismantling the reactor and 2.5 million francs for the preparation of the buildings to be kept. Once finished, this storage center will serve to assemble in one place temporarily irradiated fuels from various sources before they are sent to retreatment centers.

Putting this installation, likewise named Pegasus, into service should take place during the second half of 1980, after concurrence by the central security service for nuclear installations. The matter has not been entirely free from protests. In February 1979, the municipal council of Corbieres in Alpes de Haute-Provence requested that the project be rejected.

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VAN DER KLAAUW: NO NUCLEAR COOPERATION WITH SOUTH AFRICA

Rotterdam NRC HANDELSBLAD in Dutch 23 May 80 p 1

[Text] The Hague, 23 May--Minister of Foreign Affairs Van der Klaauw does not envisage nuclear cooperation with South Africa as taking effect. If this is to take place South Africa must first accede to the nuclear nonproliferation treaty or at least must agree to international control over all its nuclear activities, but there is no chance of this.

This is the statement made by this government official in the Second Chamber during the second term in the course of an interpolation by Waltmans (Political Party of Radicals) regarding possible Dutch involvement in the buildup of nuclear power in South Africa.

The minister was unwilling to interpret the flash of light observed by an American satellite over the South Atlantic Ocean on 23 September 1979 as being nothing else but evidence of a nuclear test. At the time State Secretary Vance told him that this must have been a meteorological phenomenon.

To be sure Van der Klaauw did express his concern over the nuclear developments in South Africa (where one installation is capable of producing enriched uranium) which are having a destabilizing influence, while certain statements made by South African leaders do not exclude the possibility of employing nuclear energy for military purposes.

Gualtherie van Weezel (Christian Democratic Action) also said it was improbable that a flash would show up on a nuclear explosion. On the other hand Waltmans considered that highly plausible.

Relus ter Beek (Labor Party) asked the government official whether besides the criteria regarding nonproliferation the antiapartheid criteria must also be applied on nuclear collaboration with South Africa. He recalled the Second Chamber's decision taken at the end of last year not to supply any more oil to South Africa.

The minister replied that he did not wish to make any assessments as to whether the rejection of apartheid, to which he subscribes, would also have an effect on other relations with South Africa.

In the framework of European political collaboration there is a proposal for a working group to be set up for the purpose of looking into proliferation questions. Holland is supporting this initiative. Van der Klaauw expects that South Africa will be the subject of discussion in connection with this. He gave assurances that for the last 3 years the government has not received any applications for export licenses for nuclear supplies for South Africa.

Moreover it does not appear to him that there are any contacts of this sort between industry and South Africa, but he says that such contacts should not be encouraged.

With regard to measures for preventing the misuse abroad of Dutch nuclear technology Van der Klaauw wants to discuss the affair concerning the Pakistani technologist Khan in the course of the coming debate and he would rather do so in a broader scope. He described as superfluous a motion on the part of Waltmans for opposing every transfer of nuclear know-how to South Africa.

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